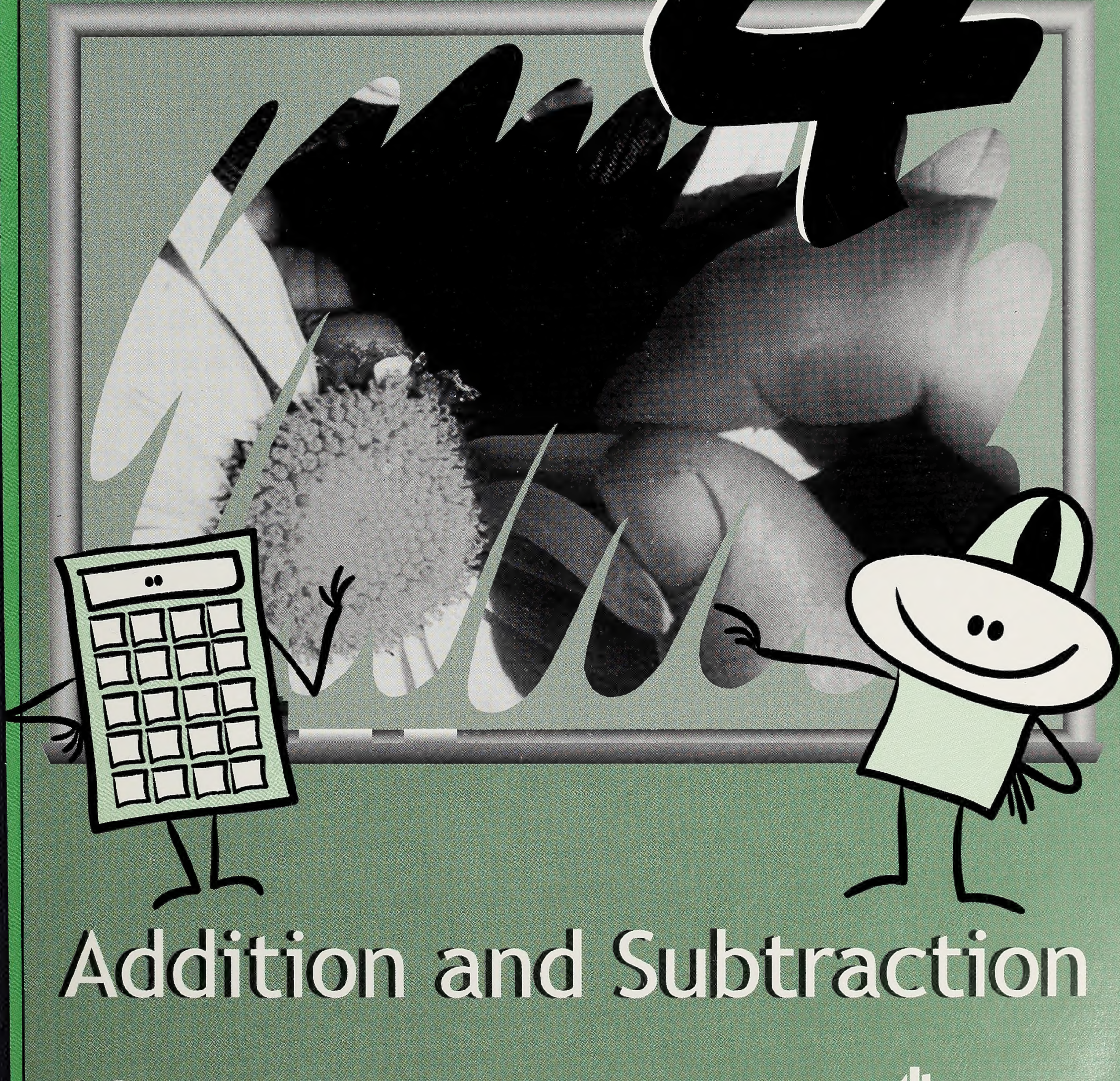
AL.2.2002-173
University of Alberta Library
0 1620 3452394 2

Mathematics 4

Module 4



Addition and Subtraction

Learning
Technologies
Branch

Alberta
LEARNING

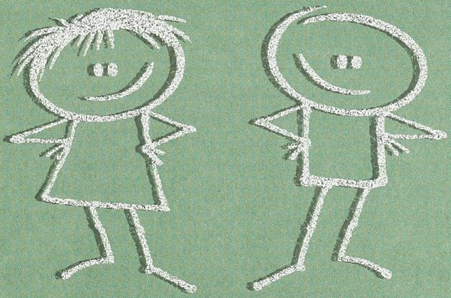
Digitized by the Internet Archive
in 2016 with funding from
University of Alberta Libraries

https://archive.org/details/mathematics404albe

Mathematics 4

Module 4

Addition and Subtraction



Learning
Technologies
Branch

Alberta
LEARNING

Mathematics 4
Module 4: Addition and Subtraction
Student Module Booklet
Learning Technologies Branch
ISBN 0-7741-1657-9

Cover Photo: Nova Development Corporation

This document is intended for	
Students	✓
Teachers	✓
Administrators	
Home Instructors	✓
General Public	
Other	

The Learning Technologies Branch has an Internet site that you may find useful. The address is as follows:

http://www.learning.gov.ab.ca/ltb

The use of the Internet is optional. Exploring the electronic information superhighway can be educational and entertaining. However, be aware that these computer networks are not censored. Students may unintentionally or purposely find articles on the Internet that may be offensive or inappropriate. As well, the sources of information are not always cited and the content may not be accurate. Therefore, students may wish to confirm facts with a second source.

ALL RIGHTS RESERVED

Copyright © 2000, the Crown in Right of Alberta, as represented by the Minister of Learning, Alberta Learning, 11160 Jasper Avenue, Edmonton, Alberta T5K 0L2. All rights reserved. Additional copies may be obtained from the Learning Resources Distributing Centre.

No part of this courseware may be reproduced in any form, including photocopying (unless otherwise indicated), without the written permission of Alberta Learning.

Every effort has been made both to provide proper acknowledgement of the original source and to comply with copyright law. If cases are identified where this effort has been unsuccessful, please notify Alberta Learning so that appropriate corrective action can be taken.

IT IS STRICTLY PROHIBITED TO COPY ANY PART OF THESE MATERIALS UNDER THE TERMS OF A LICENCE FROM A COLLECTIVE OR A LICENSING BODY.

UNIVERSITY LIBRARY
UNIVERSITY OF ALBERTA

Welcome!

Mathematics 4 contains nine modules. Work through the modules in the order given, since several concepts build on each other as you progress through the course.

Mathematics 4

Module 1
Data Management

Module 2
Number Concepts and Patterns

Module 3
Fractions and Decimals

Module 4
Addition and Subtraction

Module 5
Multiplication

Module 6
Division

Module 7
Measurement

Module 8
Exploring Geometry

Module 9
Investigating Outcomes

Icons

The book you are presently reading is called a Student Module Booklet. You will find icons used throughout it. Read the following explanations to find out what each icon tells you to do.

Pay close attention to important words or ideas.

Use manipulatives, cut-out learning aids, or pull-out pages.

Use a calculator.

Do an activity just for fun!

INTERNET Use the Internet.

QUEST 2000 Refer to the textbook *Quest 2000: Exploring Mathematics*.

Do an activity to review the concept.

Challenge Prepare to do a Challenge activity.

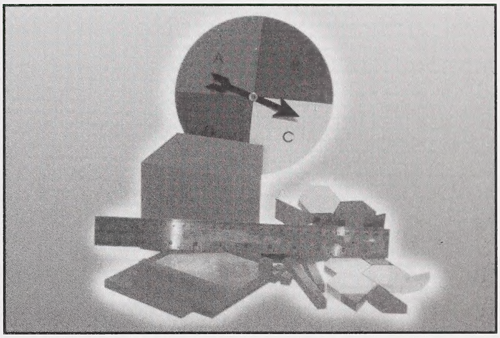
Do an activity with your home instructor.

Use the Answer Key to Self-Marking Activities in the Appendix to correct activities.

Information for the Student

The Grade 4 Mathematics course is designed to keep you actively involved in learning as you progress through the daily lessons in each of the nine modules. Besides the Student Module Booklets, you will also need a copy of the Grade 4 Mathematics textbook called *Quest 2000: Exploring Mathematics.* The textbook contains pictures, information, questions, and problems that are referred to in the modules. Each module also requires you to complete one or more Assignment Booklets to be sent to your teacher for marking.

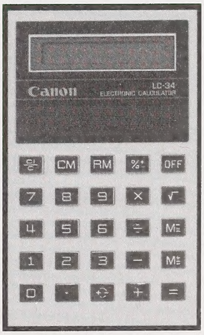
Manipulatives



Manipulatives are hands-on materials that you will be using to help you learn new concepts and ideas. They include things like base ten blocks, geoboards, spinners, counters, polygon shapes, tiles, rulers, and metre-sticks. Don't worry if you don't have all of these manipulatives. Some can be found in the Cut-Out Learning Aids section of the Appendix in several of the modules. Some you may be asked to make from materials found in your own home. However, it is highly recommended that you have a set of base ten blocks. They will be used often to help you to understand many new math concepts.

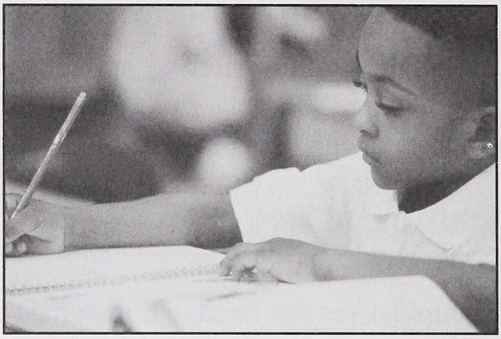
You should use manipulatives whenever you think they will help you understand something new you are learning. Manipulatives can also be useful when you are sharing or discussing what you know with your home instructor.

Calculators



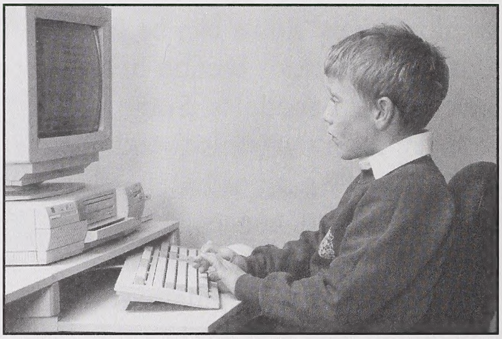
You will need a calculator for many of the activities in Mathematics 4. It is important to remember that a calculator is a tool to be used when doing difficult calculations and when investigating what numbers can do. Don't rely on the calculator for calculations that you can do in your head. For example, you would not use a calculator when estimating or doing mental math. Both of these activities rely upon mastering the basic number facts.

Basic Number Facts



You will practise the basic facts on several days of each module. Each drill is timed to encourage you to work quickly. At first, you may not do very well because you may not know all of the number facts yet, or you may have forgotten some of the number facts you learned last year. Don't worry. By practising the facts regularly, your scores will improve over time. Strategies to help you learn the number facts will be presented in the lessons.

Computers



If you have your own computer at home, you may already know some computer software programs that help you to learn mathematics. There are also many websites on the Internet that provide math activities for students to do. Throughout this course, you will find optional activities that refer to software programs and Internet websites. You should do these activities only when you have finished the daily assigned work. **Note:** Always check with your home instructor before you log onto the Internet. **Remember that any Internet website address given in this module is subject to change.**

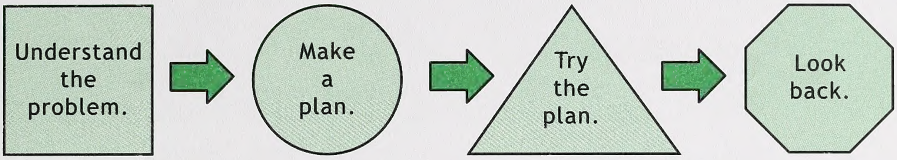
Journal Writing

In each Assignment Booklet, you will often be asked to complete a journal entry about something you have been learning in the module. Being able to put into your own words what you have learned is an important skill. It will help you think about what you know as well as help your teacher understand your thinking.

Problem-Solving Skills

You are already familiar with problem solving from earlier grades. This course will continue to help you develop strategies to make you a better problem solver. There are four steps that can be used to solve most problems.

The Four-Step Process



Step 1

Understand the problem.

In this step, you need to spend time reading over the problem in order to understand what you are being asked to find. One way to see if you understand the problem is to cover it up and then try restating it in your own words. Sometimes it might seem like not enough information is given. If this happens, try asking yourself the question, "What do I already know that will help me solve this problem?"

Step 2

Make a plan.

In this step, you decide on the method or strategy you will use to solve the problem. Different problems require different strategies. Most problems can be solved in more than one way. In this course, you will be looking at the following seven strategies:

- acting out the problem
- guessing and checking
- making an organized list
- drawing a diagram
- making a table or chart
- looking for a pattern
- making it simpler

You will be introduced to these strategies as you move through the modules. However, you may review each of the strategies at any time by turning to the Appendix of Module 1.

Remember, there is no one "right" way to solve a problem. The method or strategy you use may be different than the one your home instructor or someone else doing the problem would use. Sometimes you will find that more than one strategy on the list can be used to solve a problem. In fact, sometimes you may decide to invent a strategy of your own that is not even on the list.

Step 3

Try the plan.

In this step, you try out one of your strategies to see if it works to solve the problem. Don't worry if you can't find the answer immediately. Some problems take more than one step. You may also find it necessary to use your calculator to do some of the calculations.

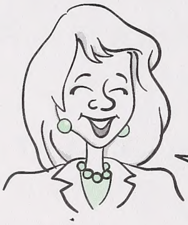
Sometimes, as you try to solve the problem, you'll find that your strategy isn't working. Don't give up. Try another method instead.

Step 4

Look back.

In this step, you take time to look at your answer and ask, "Is my answer reasonable? Does it make sense?" Writing your answer in a complete sentence may help you to see if, in fact, you have answered the question. If not, you may have to check your calculation for errors or, perhaps, try another strategy.

This is also a good time to look at the strategy you used and to think about how you could use it again in other problem-solving situations. Take time to share your strategies with your home instructor, and compare your method with the strategy your home instructor might use.



Remember, problem solving is a skill you need and will use throughout your life. The more practice you have with solving problems, the better your problem-solving skills become. Problems don't always have just one "right" answer. Some problems have several possible answers, just as some problems may be solved in several different ways.

Contents

Module Overview 1

Section 1: Exploring Adding and Subtracting

Day 1: Making Sense of Operations 4
Day 2: Addition and Subtraction Number Facts 12
Day 3: Adding Whole Numbers 29
Day 4: Addition Strategies 45
Day 5: Subtracting Whole Numbers 58
Day 6: Subtraction Strategies 74
Day 7: Assessing What You Know (I) 84

Send in Assignment Booklet 4A.

Section 2: Extending Your Adding and Subtracting Skills

Day 8: Adding and Subtracting Large Numbers 88
Day 9: Problem Solving 103
Day 10: Adding and Subtracting Decimals (Tenths) 113
Day 11: Adding and Subtracting Decimals (Hundredths) 133
Day 12: Working with Money Amounts 152
Day 13: Choosing a Calculation Method 169
Day 14: Putting It All Together 181
Day 15: Assessing What You Know (II) 183

Send in Assignment Booklet 4B.

Appendix

Glossary 188
Answer Key to Self-Marking Activities 188
Credits 230
Cut-Out Learning Aids
Number Facts Progress Chart for Module 4

Overview

Module 4:
Addition and
Subtraction

Section 1:
Exploring Adding and Subtracting

Section 2:
Extending Your Adding and Subtracting Skills

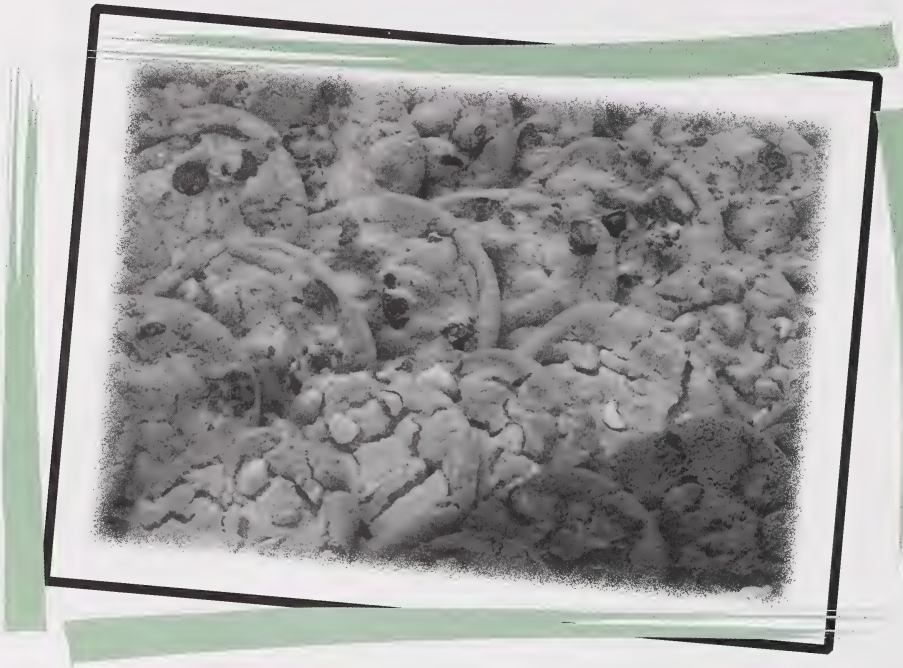
Module 4: Addition and Subtraction

In Module 2 you learned that numbers are everywhere. A day rarely goes by when you don't use numbers in some way. In fact, people use numbers so many times during the day that they usually don't even notice that they are "doing math."

Think about how you would find the solution to each of the following problems:

- You need more wire for a fence. The length of the fence is 6.8 m. You only have 4.3 m of wire. How much more wire do you need?
- You are going to the store to buy several items. Will you need $5, $50, or $500? In order to decide, you need to estimate the cost of all of the items you plan to buy.
- The bus leaves at 11:45. It's now 11:22. How long do you have to wait?
- You paid $10.00 for a book that cost $3.58. The clerk gave you $7.42 in change. Was the amount correct?

- How old will you be in the year 2009?
- How much have you grown in the last year?
- You are taking cookies to a party. How many should you take if each person is to get two cookies?



In order to calculate an answer to each of these problems, you need to add or subtract. Addition and subtraction are two of the basic math operations often used to solve everyday problems.

You have already learned many things about adding and subtracting in previous grades. In Module 4 you will explore more about how addition and subtraction are used to solve problems with whole numbers and with decimal numbers.

There are **two** Assignment Booklets for Module 4.
You should send in Assignment Booklet 4A after completing Day 7.
You should send in Assignment Booklet 4B after completing Day 15.

Section 1

Exploring Adding and Subtracting

Making Sense of Operations

What Are Number Operations?

In mathematics people often talk about **number operations** or **operations** that can be used to solve a problem.

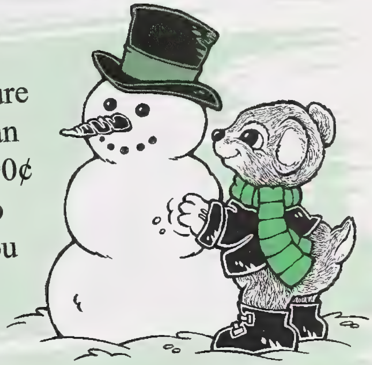
The four basic math operations are

- adding
- subtracting
- multiplying
- dividing

In fact, people use these four operations all the time in their daily lives. The basic operations are useful tools for simple things like shopping and more complex things like planning a party.

Look at the following problem to see how you might use the basic math operations.

You are planning to make two dozen miniature snowmen to sell at a craft fair. Each snowman needs 2 wiggly eyes. The wiggly eyes cost 90¢ for a package of 10. How many packages do you need to buy? How much change will you get back from $5?

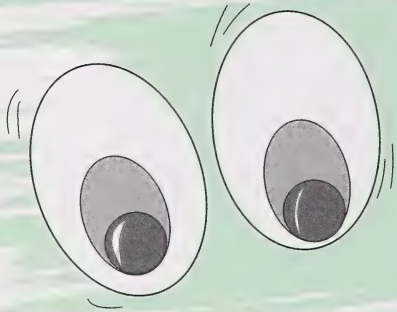


1. Look at the following chart. The first column has some of the questions that you might need to answer as you solve this problem. In the second column, write the operation you would use in order to find the answer to each question. An example is done for you.

	Question	Operation
Example	How many is "two dozen"?	add or multiply
a.	How many wiggly eyes do you need altogether?	
b.	How many packages of eyes will you need to buy?	
c.	How many eyes will be leftover?	
d.	How much will it cost in all?	
e.	How much change will you get back?	

Check your answers in the Appendix.

Were you surprised at the different operations you used? You likely did not use division, but division is often used when shopping for something.



When you get to the craft store, you find that there are two kinds of wiggly eyes for sale. One kind costs 90¢ for a package of 10 eyes. The other costs 48¢ for a package of 6 eyes. Which is the better buy?

To decide which is the best buy, you need to find the cost of one eye. To do this, use the **division** operation.

Divide the cost of the package by the number of eyes in the package.

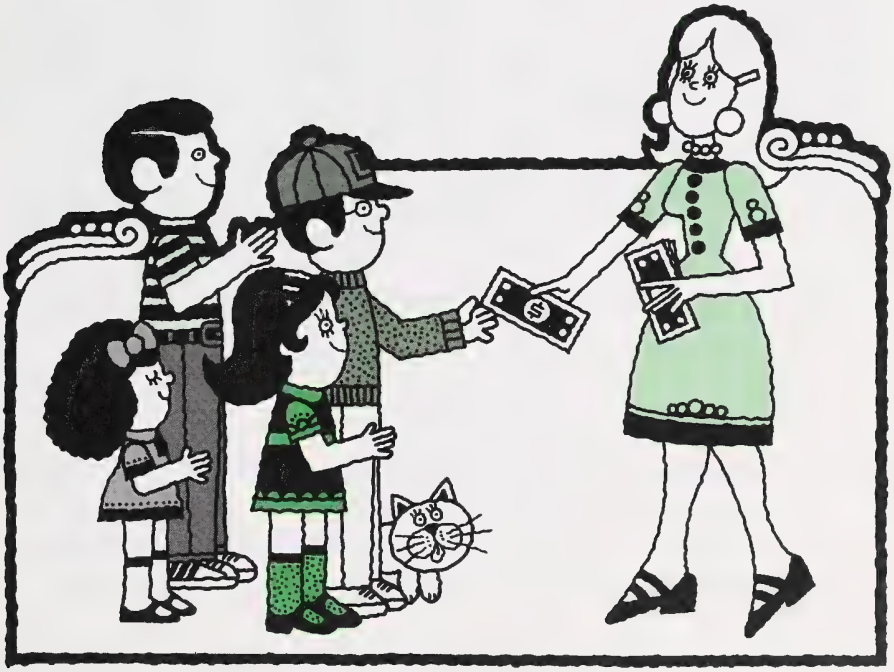
Package 1: 90¢ ÷ 10 eyes = 9¢ per eye

Package 2: 48¢ ÷ 6 eyes = 8¢ per eye

The cost for one eye is less expensive in Package 2. Package 2 is the better buy.

You can probably think of many other times when you have used adding, subtracting, multiplying, or dividing to solve simple everyday problems:

- sharing a package of 24 candies with 3 of your friends (division)
- helping make dinner by peeling 2 potatoes for each person in your family (multiplication)
- totalling the number of videos you watched over 4 weeks (addition)
- calculating how much of your allowance money would be left if you spent part of it to go see a movie (subtraction)



Perhaps you weren't even aware that you were using one of the operations.

Are you starting to see just how often you use the four basic math operations in your daily activities?

The four basic math operations are very important in problem solving. You have already been introduced to the problem-solving process, and you have practised using several strategies for solving problems. Perhaps you even invented some of your own strategies! No matter what strategy you use, you will always have to decide on one or more operations to use to calculate your answer.

Choosing an Operation

Look at the following question.

$69 + 78 = \square$

2. Write a story problem that might give you this number sentence.

In many story problems, you know right away which operation you need to use to solve the problem. For example, certain kinds of actions tell you that you need to do **addition** to solve the problem. If things are being **combined**, **joined**, or **totalled**, you need to use addition.

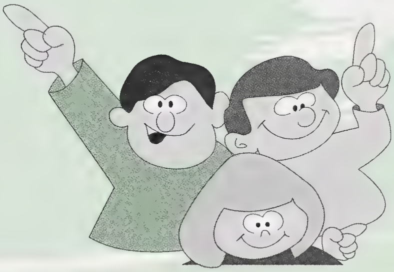
3. What type of action is occurring in your story problem that makes it an addition problem?

Check your answers in the Appendix.

In other problems, the actions tell you that you need to use **subtraction**. When things are being **separated** or **taken away**, you will use subtraction to solve the problem. You also use subtraction when you are trying to find **how much more** or **how much less** of something there is.

4. Show how you would use subtraction to solve the following problem.

There were 9 students away from school on Thursday. On Friday, 4 students were away. How many more students were away on Thursday than on Friday?



Check your answer in the Appendix.

5. For each of the following problems

- tell what operation you would use to solve the problem
- write a number sentence
- give a word answer

An example has been done for you.

Example: Eric had 17 new hockey cards. He gave 8 of them to Tyler. How many cards did Eric have left?

Operation: **subtraction**

Number sentence: **17 – 8 = 9**

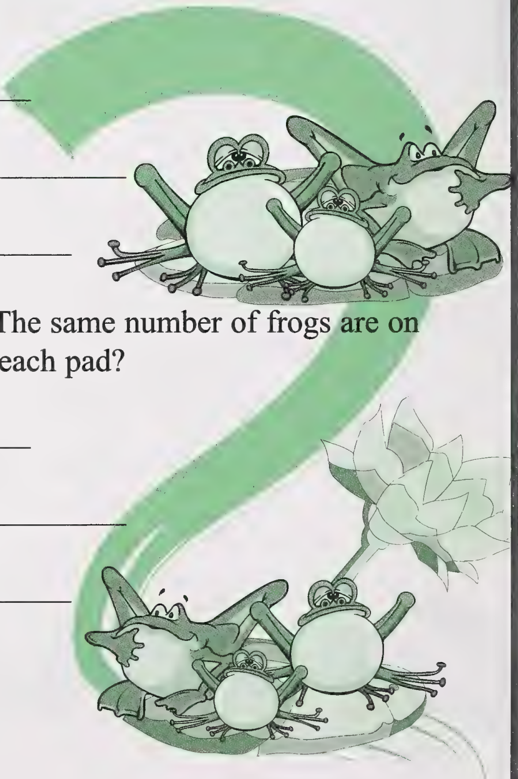
Word answer: **9 hockey cards**

a. There are 3 frogs sitting on each lily pad. How many frogs are on 4 lily pads?

Operation: ____________________

Number sentence: ____________________

Word answer: ____________________



b. There are 12 frogs on 6 lily pads. The same number of frogs are on each pad. How many frogs are on each pad?

Operation: ____________________

Number sentence: ____________________

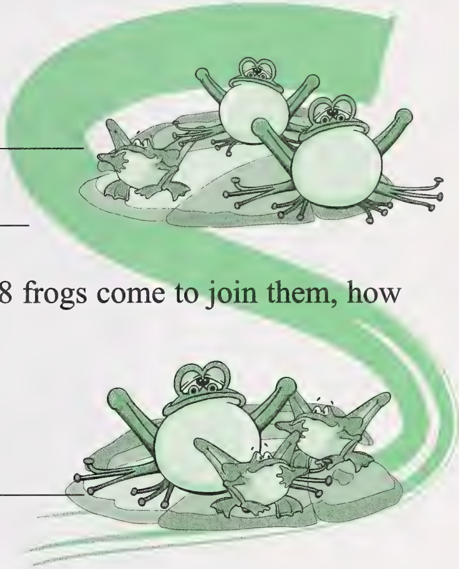
Word answer: ____________________

c. There are 12 frogs sitting in a pond. If 6 of the frogs hop away, how many frogs will be left?

Operation: ____________________

Number sentence: ____________________

Word answer: ____________________



d. There are 4 frogs sitting in a pond. If 8 frogs come to join them, how many frogs will there be in all?

Operation: ____________________

Number sentence: ____________________

Word answer: ____________________

Check your answers in the Appendix.

Did you use a different operation to solve each of the problems? As you can see, different operations are used for different kinds of problems. Sometimes the “action” in the problem gives you a clue about which operation to use. Sometimes there is no action occurring, but the problem talks about groups of things (number in a group, number of groups, total in all groups, and so on).

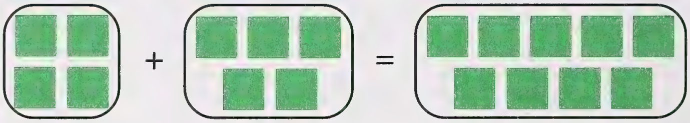
Turn to Assignment Booklet 4A, and complete the activities for Day 1.

Addition and Subtraction Number Facts

What Is Addition?

When you add, you are combining two groups into one group.

$4 + 5 = 9$ means



The numbers that are added together are called **addends**. The answer is called the **sum**.

When you solve the question $4 + 5 =$, the answer or sum is 9. What happens when you change the order of the addends?

$4 + 5 = 9$

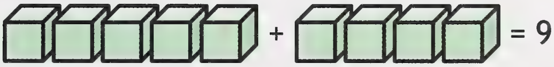
$5 + 4 =$

1. What will the answer be? How do you know?

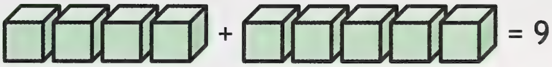
Check your answer in the Appendix.

You can add 4 and 5 in two different ways.

5 ← Addend
+ 4 ← Addend
9 ← Sum



4 ← Addend
+ 5 ← Addend
9 ← Sum



Can you see that even though the order of the addends is changed, the sum remains the same? This is true for any two numbers that are added together. This is called the **order property for addition**.

Order Property for Addition

When two or more numbers are added together, the numbers can be added in any order. The sum will be the same every time.

Only two numbers can be added at one time. When three numbers are added together, two steps must be used.

Example

$2+4+5=$

To find the sum, you can add $2+4$ first, and then add 5. Or, you can add $4+5$, and then add 2. Or, you can add $2+5$, and then add 4.

2. Show that all three ways will give the same answer for this question.

Check your answers in the Appendix.

Another rule for addition that you likely already know is the **zero property for addition**.

Zero Property for Addition

Whenever zero is added to a number, the number does not change.

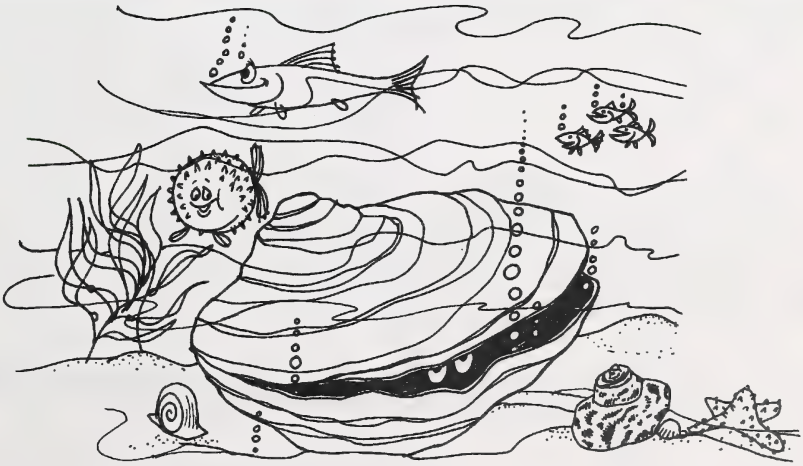
Example

$6+0=6$ $0+8=8$

3. To review the addition number facts, complete the following addition table. As you fill in the chart, see if you notice any patterns occurring. The patterns can help you complete the chart.

+	0	1	2	3	4	5	6	7	8	9
0	0	1								
1	1	2								
2										
3										
4										
5										
6										
7										
8										
9										

Check your answers in the Appendix.



Just For Fun

Play the game **"36 Card Snap."**
Number of players: 2
Materials: one deck of playing cards (Use only the ace through nine cards. Remove the tens, jacks, queens, and kings from each suit.)

Object: to win all of your opponent's cards by being the first to "Snap!"

How to play: Deal out all 36 cards face-down to two players. Decide on a sum between 10 and 18 for the game. Both players turn over the top card of their pile at the same time. If the two cards add up to the chosen sum, the players shout "Snap!" The first player to shout "Snap!" correctly wins the other player's face-up pile. Continue until one player has won all of the cards. (If a player shouts "Snap!" and the two cards **do not** add up to the chosen sum, that player loses his or her face-up pile to the other player.)

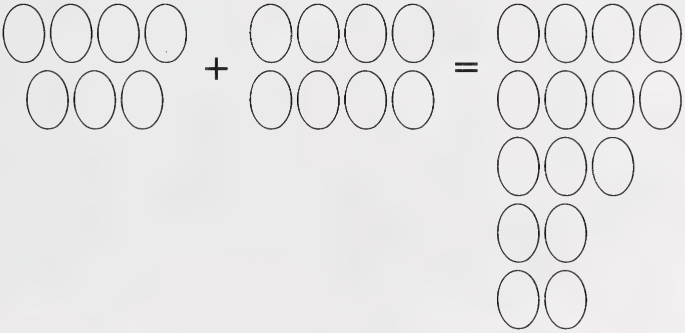
Using the Addition Facts

You can use drawings to help you solve word problems.

Example

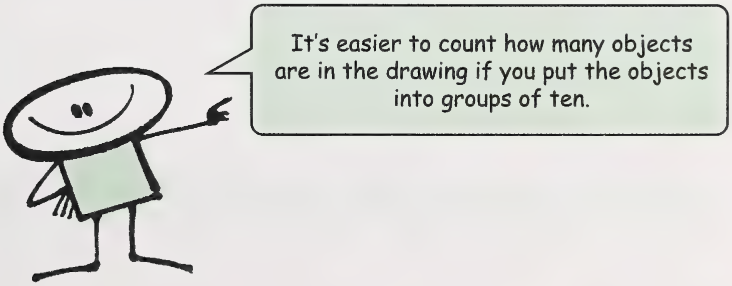
Diane collected 7 eggs in the morning. Later that day she collected 8 more eggs. How many eggs did she collect in all?

7 + 8 =



7 + 8 = 15

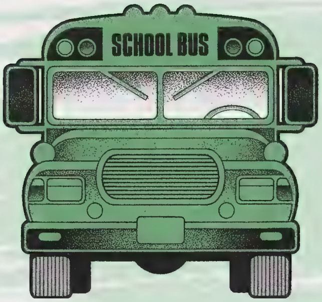
Diane collected 15 eggs in all.


It's easier to count how many objects are in the drawing if you put the objects into groups of ten.

4. Solve each of the following word problems. Use drawings to show how you arrived at each answer.

   a. The school cafeteria sold 9 apple drinks and 7 orange drinks at noon. How many drinks were sold altogether?

   b.



A school bus picked up 6 students at the first stop and 8 students at the second stop. How many students were picked up after two stops?

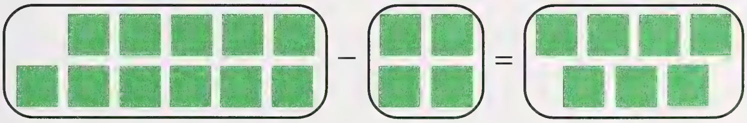
Check your answers in the Appendix.

What Is Subtraction?

When you subtract, you are taking one number away from another number or group.

Example

$11 - 4 = 7$ means



When one number is subtracted from another number, the answer is called the **difference**. When 4 is subtracted from 11, the difference is 7.

$$\begin{array}{r} 11 \\ -\ \ 4 \\ \hline 7 \end{array} \longleftarrow \text{Difference}$$

When you solve the problem $11 - 4 = \square$, the difference is 7. What happens when the question is written in a different way?

$11 - 4 = 7$ $\qquad\qquad$ $11 - \square = 4$

5. What number will go in the box? How do you know?

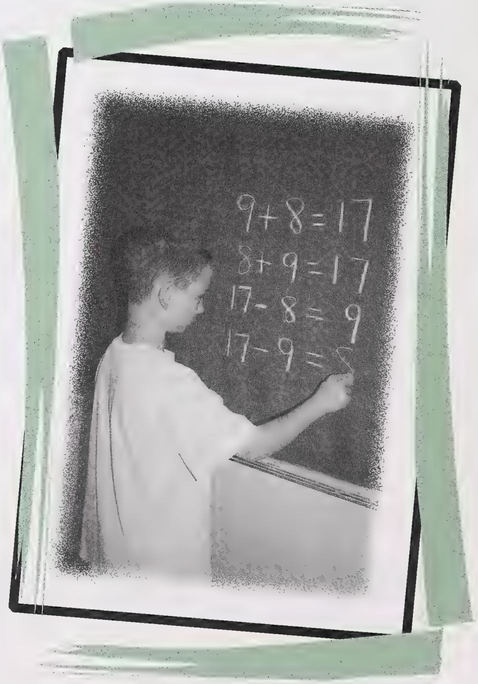
Check your answer in the Appendix.

If you know a number fact such as $11 - 4 = 7$, you can use that fact to write three other facts. Four facts that use the same numbers are called **related facts**.

$$\left.\begin{array}{r} 11 - 4 = 7 \\ 11 - 7 = 4 \\ 7 + 4 = 11 \\ 4 + 7 = 11 \end{array}\right\rangle \text{Related facts}$$

Can you see how knowing the addition facts will help you to learn the subtraction facts? When you know one fact, you really know four facts!

By now you should know most of the subtraction facts. All of the facts need to be memorized so that you can give the answers quickly without counting or calculating. The best way to memorize the number facts is to practise them on a regular basis.



6. Find the answer to each addition fact in Column I. Then write a related subtraction fact in Column II.

	Column I	Column II
a.	6 + 7 =	
b.	5 + 9 =	
c.	8 + 7 =	
d.	9 + 4 =	
e.	8 + 9 =	
f.	4 + 8 =	
g.	6 + 9 =	
h.	7 + 7 =	
i.	8 + 6 =	

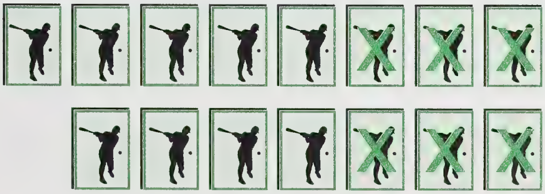
Check your answers in the Appendix.

Using the Subtraction Facts

You can also use drawings to help you solve subtraction problems.

Example

Glen took 15 baseball cards to trade at school. He traded 6 of his cards. How many cards did he have left?



$15 - 6 = \mathbf{9}$

Glen had **9** cards left.

7. Solve the following word problems. Use drawings to show how you arrived at each answer.

a.

Fran had 17 guppies in her fish tank. She sold 9 of them. How many guppies does she have now?

b. Susan had $16. She bought a book for $8. How much money does she have left?

Check your answers in the Appendix.

Basic Number Facts Practice

Turn to the Number Facts Progress Chart for Module 4 in the Appendix. Remove the chart from the Appendix and hang it in your study area. You will use this chart to record your scores for the number facts drills in Module 4.

Ask your home instructor to time you as you complete the following exercises. Your goal is to complete all 25 questions in each exercise in 2 minutes. At the end of 2 minutes, count up how many questions you were able to complete. Write this number in the chart below. Then use the answer key in the Appendix to mark the exercise, and record your score in the space provided. Before you move on, go back and complete any questions you did not finish during the 2 minutes. Mark these questions using the answer key as well.

Basic Number Facts Practice

Addition Number Facts

Number Completed in 2 Minutes ______

Number Correct in 2 Minutes ______

Subtraction Number Facts

Number Completed in 2 Minutes ______

Number Correct in 2 Minutes ______

Record your score on the Number Facts Progress Chart.

8. Addition Number Facts

Timed Exercise: 2 minutes

$$\begin{array}{r} 8 \\ +\ 7 \\ \hline \end{array} \qquad \begin{array}{r} 7 \\ +\ 6 \\ \hline \end{array} \qquad \begin{array}{r} 8 \\ +\ 9 \\ \hline \end{array} \qquad \begin{array}{r} 6 \\ +\ 8 \\ \hline \end{array} \qquad \begin{array}{r} 9 \\ +\ 5 \\ \hline \end{array}$$

$5 + 7 =$ $\qquad 9 + 9 =$ $\qquad 9 + 4 =$ $\qquad 7 + 7 =$ $\qquad 8 + 6 =$

$$\begin{array}{r} 5 \\ +\ 8 \\ \hline \end{array} \qquad \begin{array}{r} 8 \\ +\ 8 \\ \hline \end{array} \qquad \begin{array}{r} 7 \\ +\ 9 \\ \hline \end{array} \qquad \begin{array}{r} 6 \\ +\ 7 \\ \hline \end{array} \qquad \begin{array}{r} 9 \\ +\ 8 \\ \hline \end{array}$$

$6 + 9 =$ $\qquad 4 + 9 =$ $\qquad 7 + 8 =$ $\qquad 9 + 7 =$ $\qquad 5 + 6 =$

$$\begin{array}{r} 5 \\ +\ 9 \\ \hline \end{array} \qquad \begin{array}{r} 8 \\ +\ 5 \\ \hline \end{array} \qquad \begin{array}{r} 9 \\ +\ 3 \\ \hline \end{array} \qquad \begin{array}{r} 4 \\ +\ 8 \\ \hline \end{array} \qquad \begin{array}{r} 9 \\ +\ 6 \\ \hline \end{array}$$

Check your answers in the Appendix.

STOP

9. Subtraction Number Facts
Timed Exercise: 2 minutes

$$\begin{array}{r} 14 \\ -\ \ 5 \\ \hline \end{array} \qquad \begin{array}{r} 16 \\ -\ \ 9 \\ \hline \end{array} \qquad \begin{array}{r} 18 \\ -\ \ 9 \\ \hline \end{array} \qquad \begin{array}{r} 13 \\ -\ \ 7 \\ \hline \end{array} \qquad \begin{array}{r} 12 \\ -\ \ 8 \\ \hline \end{array}$$

$13 - 8 =$ $\qquad$ $14 - 7 =$ $\qquad$ $11 - 9 =$ $\qquad$ $14 - 6 =$ $\qquad$ $17 - 8 =$

$$\begin{array}{r} 14 \\ -\ \ 6 \\ \hline \end{array} \qquad \begin{array}{r} 12 \\ -\ \ 9 \\ \hline \end{array} \qquad \begin{array}{r} 15 \\ -\ \ 6 \\ \hline \end{array} \qquad \begin{array}{r} 17 \\ -\ \ 9 \\ \hline \end{array} \qquad \begin{array}{r} 15 \\ -\ \ 9 \\ \hline \end{array}$$

$13 - 6 =$ $\qquad$ $15 - 8 =$ $\qquad$ $13 - 9 =$ $\qquad$ $16 - 7 =$ $\qquad$ $12 - 4 =$

$$\begin{array}{r} 13 \\ -\ \ 4 \\ \hline \end{array} \qquad \begin{array}{r} 15 \\ -\ \ 7 \\ \hline \end{array} \qquad \begin{array}{r} 12 \\ -\ \ 5 \\ \hline \end{array} \qquad \begin{array}{r} 14 \\ -\ \ 9 \\ \hline \end{array} \qquad \begin{array}{r} 13 \\ -\ \ 5 \\ \hline \end{array}$$

Check your answers in the Appendix.

Taking Another Look

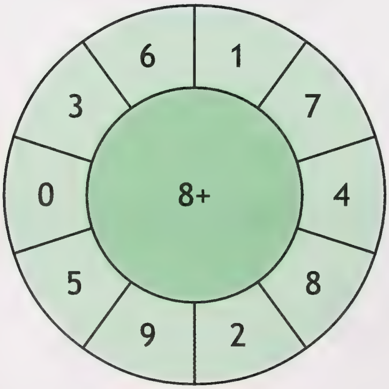
The following activities are optional. You may choose to do them or not. You **should** complete the activities if you are still having difficulty with the basic addition or subtraction facts.

If you choose **not** to do the activities at this time, you may wish to return here later to review the basic facts before completing the review activities for Day 14.

Math Wheels

If you need more practice with the addition number facts, or if you want to improve your speed, try using math wheels.

- Cut out a circle.
- Use a ruler to divide the circle into ten equal sections, as if you were cutting a pie into pieces.
- Trace around a glass or a soup can to make a smaller circle in the middle of the big circle.
- Write a number (with a plus sign) in the middle circle.
- Write the numbers from 0 to 9 in random order around the edge of the wheel. Your wheel should look like this.



This is what your "8 plus wheel" should look like.

- Go around the wheel as quickly as you can and say each number fact aloud. For example,

  "8 plus 1 equals 9."
  "8 plus 7 equals 15."

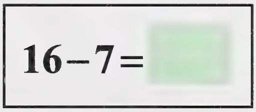
- Ask your home instructor to write the correct answers on the back of the wheel.

Make other wheels with different numbers in the middle and practise often!

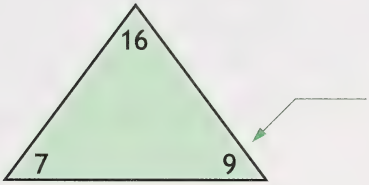
Flash Cards

If you haven't already made flash cards for the number facts you don't know, you should do that now.

Here are two ways to make flash cards.



Write the answer (**9**) on the back.



Cover this number with your thumb.

Calculator Activity: Hit the Target

This is a calculator game to give you practice with basic addition facts and mental math.

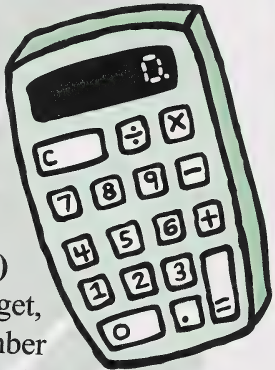
Number of players: 2

Materials:
- one calculator with memory function
- pencil and paper for keeping score

Object: to be the first person to reach the target sum and score a point

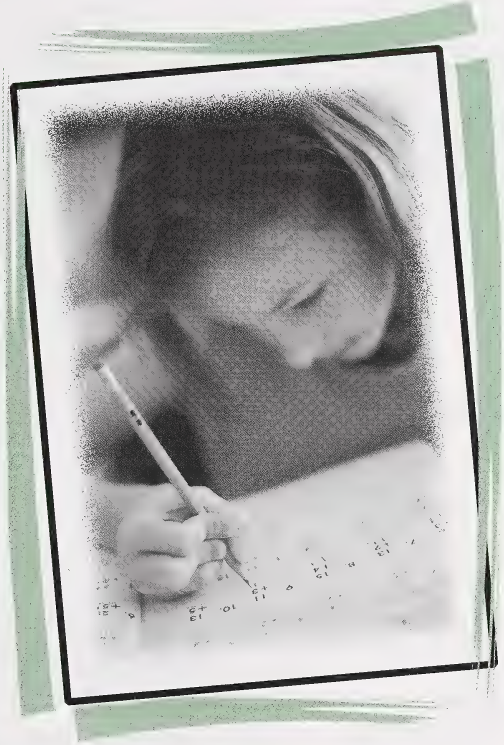
How to play: After clearing the calculator's memory, two players select a target sum. They take turns entering numbers between 1 and 5. Each new sum is put into the memory by pressing the **M+** key.

The player who thinks the target number is in the memory just after his or her turn calls out "Target!" and presses the memory-recall **(MR)** key to check. If the number showing is the target, the player receives one point. If the target number showing is incorrect, the other player is awarded the point. Play continues until one player reaches ten points.



Turn to Assignment Booklet 4A, and complete the activities for Day 2.

Adding Whole Numbers



Addition of Two- and Three-Digit Numbers (No Regrouping)

The answer you get whenever you add two or more numbers together is called the sum.

When two- or three-digit numbers are added, the common way to find the sum is to add one column of digits at a time. You begin with the right-hand column (the ones) and move to the left one column at a time.

Base ten drawings can be used to help show the process of addition.

Example

Trevor played a video game. He scored 64 points during the game and got 23 bonus points. What was his total score?

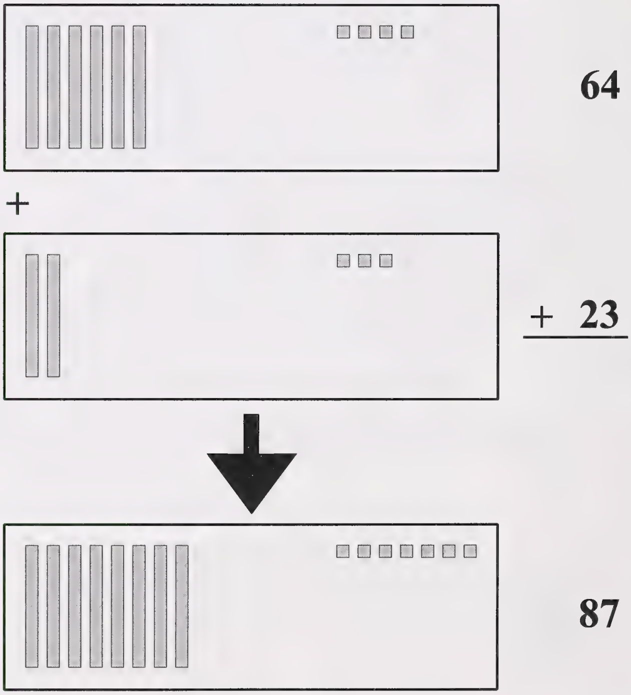
Use base ten drawings to find the total score.

64 + 23 = ☐

Draw 64 as 6 tens and 4 ones.

Draw 23 as 2 tens and 3 ones.

Add the ones first. Then add the tens. The resulting total is 8 tens and 7 ones.



Trevor's total score was 87.

1. Use base ten drawings to find the sum of $532 + 146$.

+

+

↓

2. Find the sum for each of the following questions.

a. $\begin{array}{r} 58 \\ +\ 41 \\ \hline \end{array}$ **b.** $\begin{array}{r} 361 \\ +\ 522 \\ \hline \end{array}$ **c.** $\begin{array}{r} 30 \\ +\ 36 \\ \hline \end{array}$ **d.** $\begin{array}{r} 405 \\ +\ 53 \\ \hline \end{array}$ **e.** $\begin{array}{r} 13 \\ +\ 40 \\ \hline \end{array}$

3. Use digits to write each number.

a. twenty-six ________________

b. three hundred ninety ________________

c. seven hundred forty-one ________________

4. Use words to write each number.

a. 65 ____

b. 209 ____

c. 188 ____

Check your answers in the Appendix.

Addition of Two-Digit Numbers (with Regrouping)

In Module 2 you learned that only one digit can be written in each place-value column. This idea will help you understand the need for regrouping certain numbers when doing addition.

Base ten blocks can be used to show what happens when you regroup during addition. For the following example and questions, follow along with your set of base ten blocks or use the cut-out base ten manipulatives from Module 2.

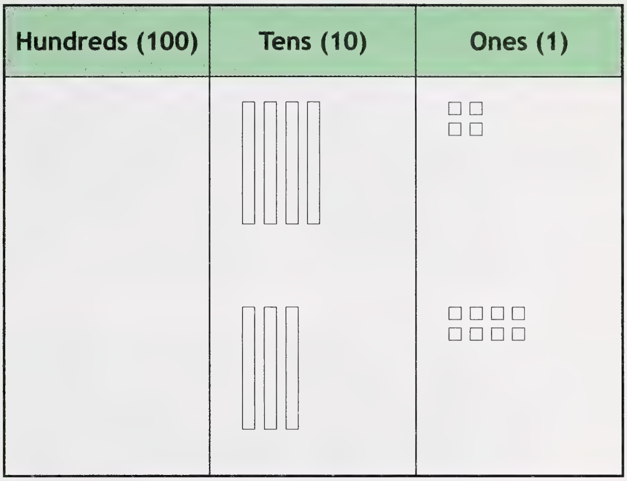
You also need the base ten mat for Day 3 found in the Cut-Out Learning Aids section of the Appendix. The mat is printed on two pages. Remove both pages and trim the edges with scissors. Then tape the two pages together. Your base ten mat should look like this.

Hundreds (100)	Tens (10)	Ones (1)

Base Ten Mat

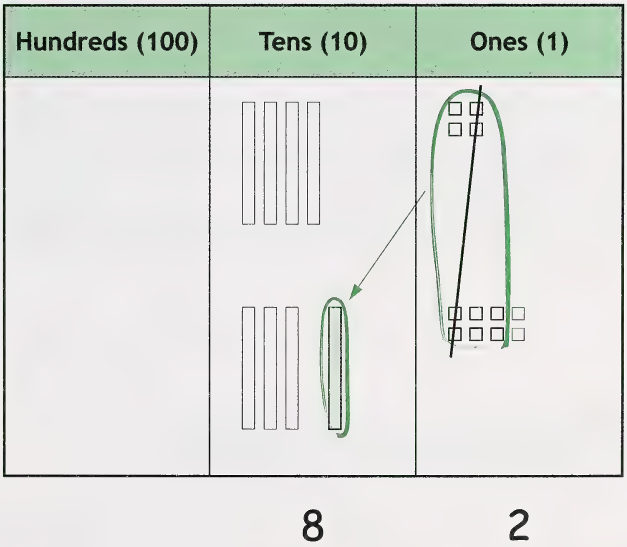
Example

Use base ten blocks to find the sum of $44 + 38$.


Hundreds (100)
Tens (10)
Ones (1)

Show 44 on the base ten mat.

Show 38 more being added.


Hundreds (100)
Tens (10)
Ones (1)
8
2

Add the ones. If there are 10 or more ones, regroup them. Make a group of 10 ones.

10 ones = 1 ten

Move the 1 ten to the Tens column.

Total each column to find the sum.

The common way to find a sum is to write one number above the other with the last digits (the ones) lined up.

$$\begin{array}{r} \text{Ones} \\ \downarrow \\ 44 \\ +\ 38 \\ \hline \end{array}$$

First add the ones: $4+8=12$ ones. Twelve ones is the same as 1 ten and 2 ones. Write the 2 in the ones column and move the 1 ten to the tens column.

$$\begin{array}{r} ^{1} \\ 44 \\ +\ 38 \\ \hline 2 \end{array} \quad \text{Regrouping}$$

Next, add the three numbers in the tens column: $1+4+3=8$ tens. Write the 8 in the tens column. The sum is 82.

$$\begin{array}{r} ^{1} \\ 44 \\ +\ 38 \\ \hline 82 \end{array}$$

This is the common way of doing addition when regrouping is involved. There are other ways to do addition. Perhaps you have discovered some of your own. It's fun to experiment with numbers to see what happens when you do something differently.

5. Find the sum for each of the following.

a. $\begin{array}{r} 29 \\ +\ 67 \\ \hline \end{array}$

b. $\begin{array}{r} 45 \\ +\ 29 \\ \hline \end{array}$

c. $\begin{array}{r} 38 \\ +\ 7 \\ \hline \end{array}$

d. $\begin{array}{r} 48 \\ +\ 32 \\ \hline \end{array}$

e. $\begin{array}{r} 56 \\ +\ 17 \\ \hline \end{array}$

Check your answers in the Appendix.

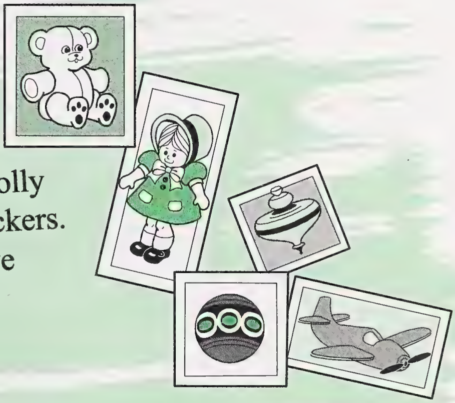
Addition of Three-Digit Numbers (with Regrouping)

Use your set of base ten blocks and the base ten mat to follow along with the next example.

When you add two-digit numbers, you start with the ones. You use the same method for adding three-digit numbers. You begin with the ones, and then add the tens, and then finally add the hundreds.

Example

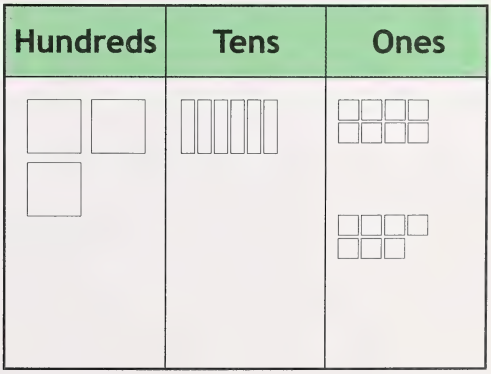
Holly and Karen collect stickers. Holly has 368 stickers. Karen has 267 stickers. How many stickers do the girls have altogether?



To solve this problem, you need to find the sum.

368 + 267 =

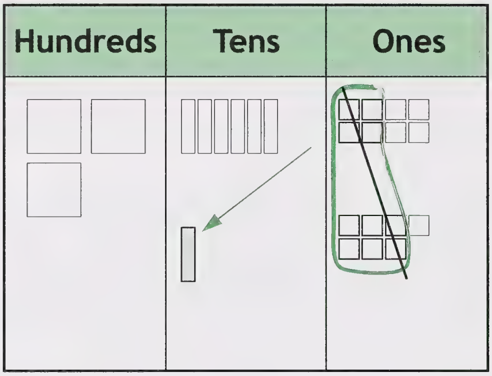
Show 368 by placing 3 hundreds, 6 tens, and 8 ones on the base ten mat. To add 267, begin by adding 7 more ones. On the mat, put 7 more ones in the Ones column.



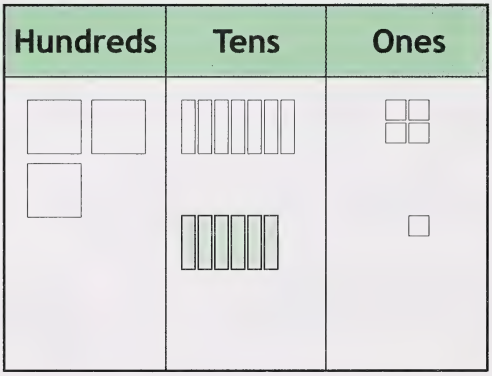
- Count up the ones.

$8+7=15$ ones

Fifteen ones is the same as 1 ten and 5 ones. Trade 10 ones for 1 ten and place the 1 ten in the Tens column. This leaves 5 ones in the Ones column.


Hundreds
Tens
Ones

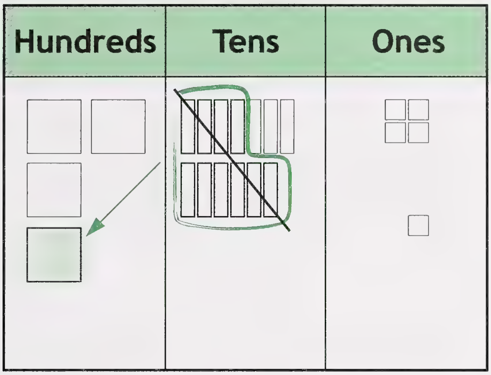
Next, you need to add 6 more tens. On the mat, put 6 more tens in the Tens column.


Hundreds
Tens
Ones

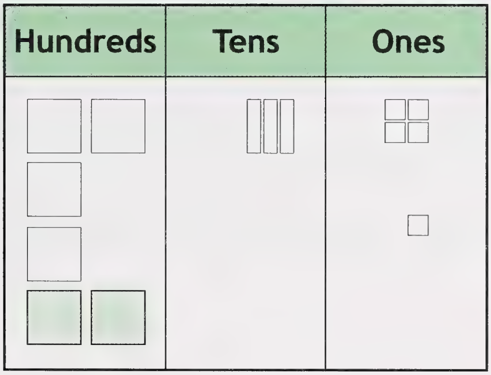
- Count up the tens.

$6+1+6=13$ tens

Thirteen tens is made up of 10 tens and 3 tens. Ten tens equals 1 hundred. Trade 10 tens for 1 hundred and move the 1 hundred to the Hundreds column. This leaves 3 tens in the Tens column.


Hundreds
Tens
Ones

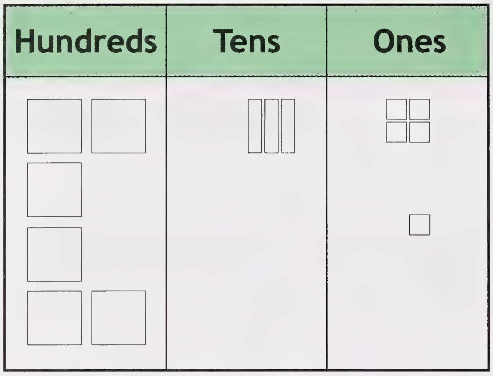
Finally, you need to add 2 more hundreds. On the mat, place 2 more hundreds in the Hundreds column.


Hundreds
Tens
Ones

- Count up the hundreds.

$3+1+2=6$ hundreds

Since there are fewer than 10 hundreds, there is no need to regroup.



Altogether, the girls have 635 stickers.

6. Find the sum for each of the following questions. Use your base ten chart and base ten blocks if you need to.

a. $\begin{array}{r} 443 \\ +\ 208 \\ \hline \end{array}$

b. $\begin{array}{r} 586 \\ +\ 179 \\ \hline \end{array}$

c. $\begin{array}{r} 274 \\ +\ 356 \\ \hline \end{array}$

d. $\begin{array}{r} 726 \\ +\ 84 \\ \hline \end{array}$

e. $\begin{array}{r} 345 \\ +\ 472 \\ \hline \end{array}$

Check your answers in the Appendix.

In question 6.d., notice that where there is no digit below the 7 in the hundreds place, you treat the empty space as though it were a zero.

Using Diagrams to Explain Addition with Regrouping

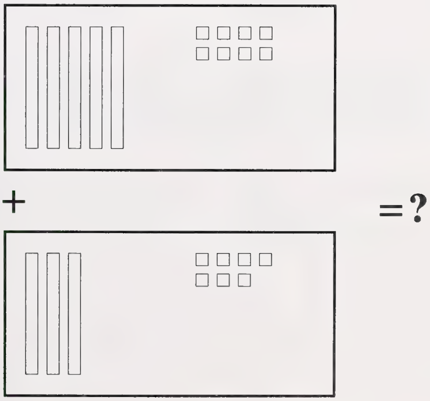
Diagrams are a good way of showing addition when regrouping is involved. Think back to what you just did with the manipulatives when you added three-digit numbers.

Use base ten drawings to find the answers to the following problems. If you need to, use your base ten blocks to help you with your drawings.

Example

Trent's Boy Scout troop held a car wash to raise money. The first day they washed 58 cars. The second day they washed 37 cars. How many cars did they wash over the two days?

To solve this problem, you need to find the sum of $58 + 37$.

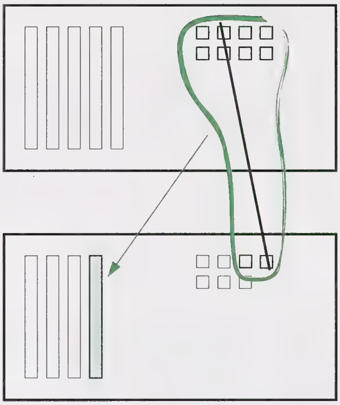


Show 58 as 5 tens and 8 ones.

Show 37 as 3 tens and 7 ones.

To find the sum, start by adding the ones. There are 15 ones in all.

Ask yourself, "Do I have enough ones to make another ten?" In this case, the answer is "yes," so circle 10 ones and regroup them into 1 ten. Cross out the circled ones with a single line.



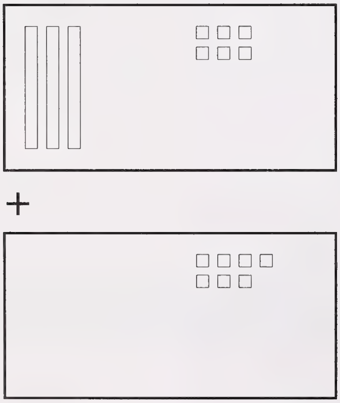
Ask yourself, "How many tens and how many ones do I have now?"

There are now 9 tens and 5 ones.

$58 + 37 = 95$

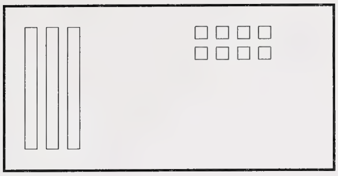
7. Regroup the base ten blocks in the following addition questions to find each sum.

a.

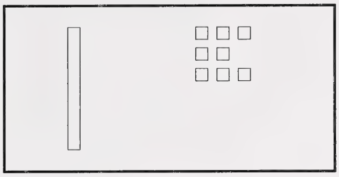


= ____________

b.

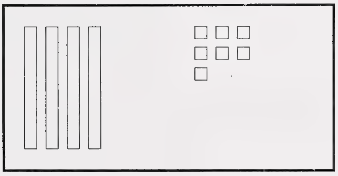


+

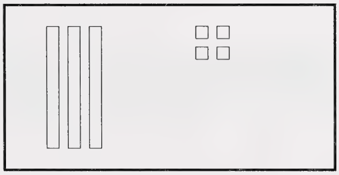


= ________

c.



+



= ________

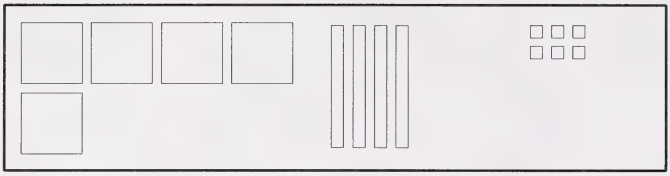
Check your answers in the Appendix.

You can use the same method to draw diagrams to show the addition of three-digit numbers. For each place-value column, simply ask yourself if you have enough to make ten.

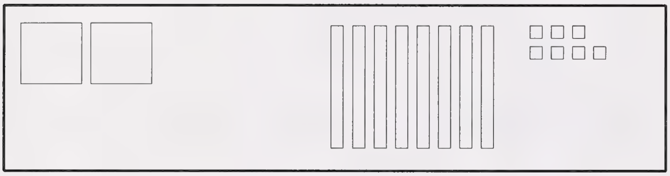
8. Use base ten drawings to answer the following addition question. If you need to, use your base ten blocks to help you with your drawings.

546 + 287 =

Show how you would find the sum of the two numbers in the drawings by regrouping.



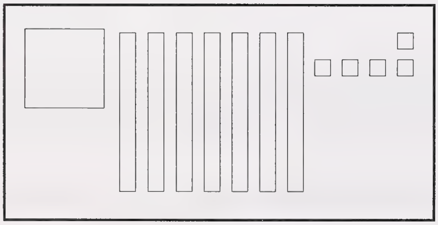
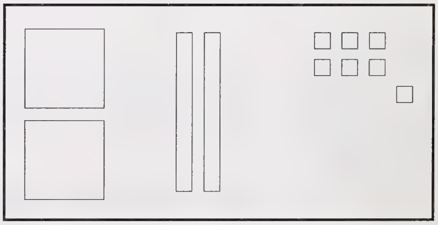
+



= ____________

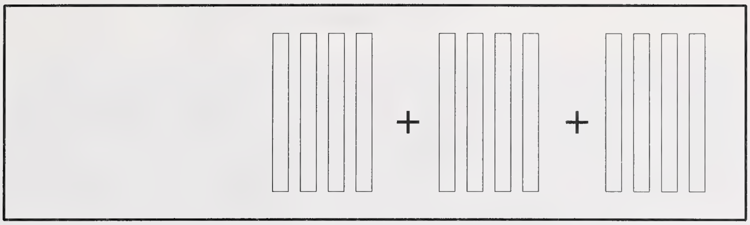
Check your answer in the Appendix.

9. Regroup in the following addition problems to find each sum.

a.  + 

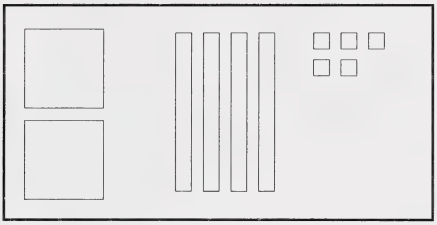
= ____________

b.

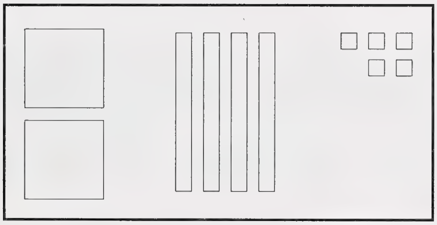


= __________

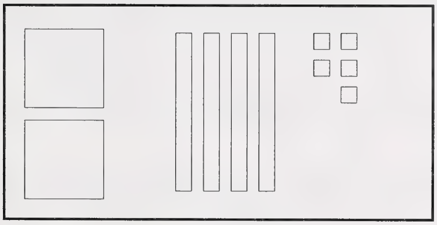
c.



+



+



= __________

Check your answers in the Appendix.

Taking Another Look

The following activity is optional. You may choose to do it or not. You **should** complete the activity if you are still having difficulty with addition of two- and three-digit numbers.

If you choose **not** to do the questions at this time, you may wish to return here later to review addition before completing the review activities for Day 14.

Find each sum.

1. $\begin{array}{r} 37 \\ +\ 84 \\ \hline \end{array}$

2. $\begin{array}{r} 347 \\ +\ \ 28 \\ \hline \end{array}$

3. $\begin{array}{r} 208 \\ +\ 465 \\ \hline \end{array}$

4. $\begin{array}{r} 67 \\ +\ 57 \\ \hline \end{array}$

5. $\begin{array}{r} 52 \\ +\ 99 \\ \hline \end{array}$

6. $\begin{array}{r} \$8.56 \\ +\ \$0.68 \\ \hline \end{array}$

7. $\begin{array}{r} 479 \\ +\ 584 \\ \hline \end{array}$

8. $\begin{array}{r} 814 \\ +\ \ 39 \\ \hline \end{array}$

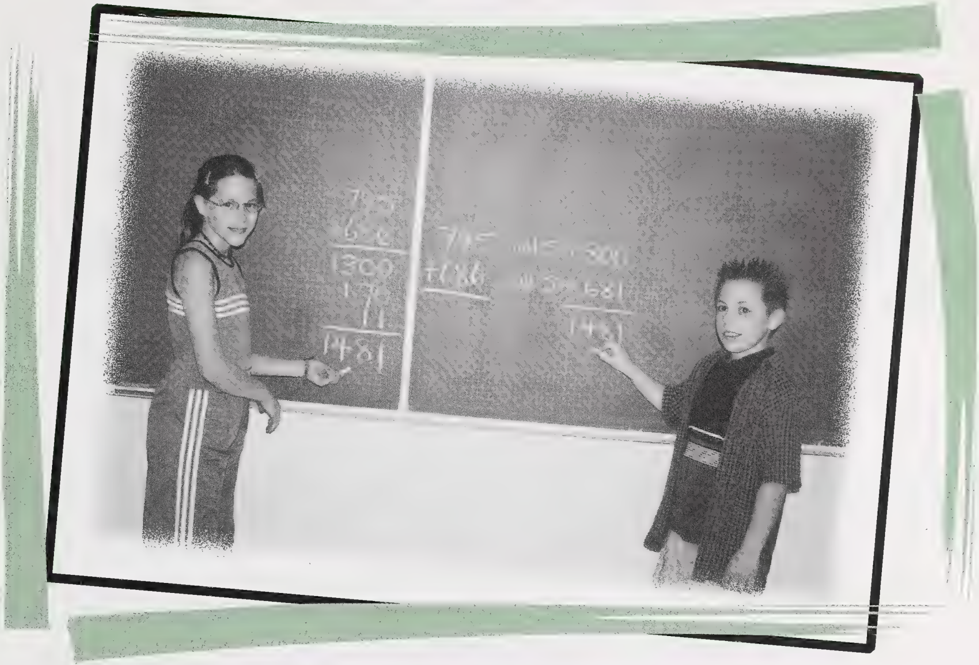
9. $\begin{array}{r} \$7.53 \\ +\ \$8.48 \\ \hline \end{array}$

10. $\begin{array}{r} 226 \\ +\ 895 \\ \hline \end{array}$

Check your answers in the Appendix.

Turn to Assignment Booklet 4A, and complete the activities for Day 3.

Addition Strategies



Different Ways of Adding

Not everybody does addition exactly the same way. Write the question $69 + 78 = ?$ on a piece of paper and ask your home instructor to calculate the answer. While your home instructor is working, solve the following problem. Show your calculations in the box at the top of the next page.

1. Jacob was helping his 4-H club clean up the ditches along the highway. By the end of the day, they had collected 69 bottles and 78 cans. How many cans and bottles did they collect altogether?

POP
275ml
COLA

Check your answer in the Appendix.

Look back at your calculation. Do you have a special method for doing addition? Are there rules that you follow each time you add? Do you add all addition questions the same way?

How did your home instructor do the calculation? Was his or her method similar to yours? Was it completely different?

With your home instructor, look at the following two ways of calculating the answer for the same problem.

Method 1

$$\begin{array}{r l} 69 & \\ +\ 78 & \\ \hline 130 & \text{Add the tens.} \\ +\ 17 & \text{Add the ones.} \\ \hline 147 & \end{array}$$

Method 2

$$\begin{array}{r c r l} 69 & \rightarrow & 70 & \text{Round up 1.} \\ +\ 78 & \rightarrow & +\ 80 & \text{Round up 2.} \\ \cline{1-1}\cline{3-3} & & 150 & \\ & & -\ 3 & \text{Subtract 3.} \\ \cline{3-3} & & 147 & \end{array}$$

Can you figure out what is happening in each of these methods? Ask your home instructor to discuss the two methods with you. Compare these methods to your own method.

Turn to page 87 in your textbook. Look at Question 1. Read and discuss with your home instructor the two methods shown for adding. Compare your own method of adding to these methods.

2. Show your home instructor how you would solve the question $697 + 842$. Do your work in the space provided.

Check your answer in the Appendix.

3. Try finding the sum for the following question in two different ways.

$596 + 329 =$

Method 1

Method 2

Check your answers in the Appendix.

Using Estimation When Doing Addition

In Module 2 you learned about the importance of estimating in everyday life. Estimation is useful when you need to

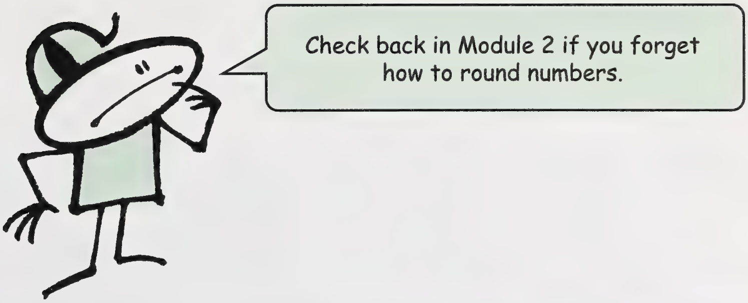
- count large numbers of objects
- measure about how much time a chore might take
- calculate about how much several items might cost
- measure the length or weight of an object

You can use estimation when you are doing any of the math operations. Estimation does not give an exact answer. It gives an answer that is **close to** the exact or actual answer. The estimate can be used to find out if the exact answer is reasonable.

Example

At Centreville School, 525 students are girls and 377 students are boys. How many students go to this school? Estimate first and then find the exact answer.

To estimate the number of students, you need to use rounded numbers. Usually you will round the numbers so that all the digits except for the first digit are changed to zero. For example, 525 would be rounded to 500 (the nearest hundred).


Check back in Module 2 if you forget how to round numbers.

To estimate the sum . . . → . . . round the numbers to the nearest hundred. → Then add the rounded numbers.

$$\begin{array}{r} 525 \\ +\ 377 \\ \hline \end{array}$$

$525 \rightarrow 500$
$377 \rightarrow 400$

$$\begin{array}{r} 500 \\ +\ 400 \\ \hline 900 \end{array}$$

The estimated sum of 525 and 377 is 900.

$$\begin{array}{lr} & 500 \\ & +\ 400 \\ \cline{2-2} \text{Estimated sum:} & 900 \end{array}$$

The exact sum of 525 and 377 is 902.

$$\begin{array}{lr} & 525 \\ & +\ 377 \\ \cline{2-2} \text{Exact sum:} & 902 \end{array}$$

There are 902 students at Centreville School.

In this example, estimation was used to predict what the answer should be close to. The estimated sum is not exact, but it is close to the exact sum. This tells you that your answer is probably correct.

You can also do the estimation **after** you calculate an exact sum. By doing the estimation afterwards, you can use the estimated sum to check the exact answer.

Example

The Centreville School Choir put on a spring concert on Friday and Saturday. There were 618 people at the concert on Friday. There were 795 people at the concert on Saturday. Altogether, how many tickets were sold?

The arithmetic sentence used to solve this problem is $618 + 795 =$.

Suppose you did your exact calculation this way.

$$\begin{array}{r l}
{}^{1\,1} & \\
618 & \\
+\ 795 & \\
\hline
1613 & \text{Exact sum}
\end{array}$$

You could then estimate to check your answer.

$$\begin{array}{r r l}
618 \rightarrow & 600 & \\
795 \rightarrow & +\ 800 & \\
\cline{2-2}
 & 1400 & \text{Estimated sum}
\end{array}$$

The estimated sum is quite a bit smaller than the exact sum, which suggests that you may have made a mistake. If you check back, you should be able to see the mistake in the hundreds column.

$$\begin{array}{r}
{}^{1\,1} \\
\mathbf{6}18 \\
+\ 795 \\
\hline
\mathbf{14}13
\end{array}$$

In this case, you were able to use your estimate to help find an error in your calculation.

4. Use rounding to estimate the sum for each problem. Then find the exact answer.

a. $38 + 58 =$

Estimate	Exact

b. $629 + 284 =$

Estimate	Exact

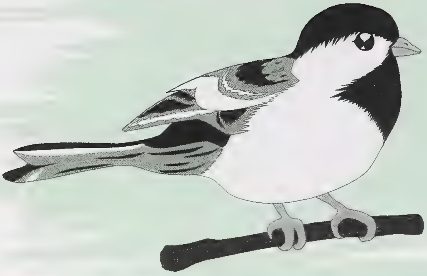
c. $397 + 74 =$

Estimate	Exact

Check your answers in the Appendix.

5. Use rounding to estimate the answer for each story problem. Use the word "about" in your answer when giving an estimated answer.

a.



A bird-watcher's club did a bird count one day in the winter. The following birds were counted:

- 252 blue jays
- 445 chickadees
- 697 sparrows

About how many birds were counted in all? (Estimate only.)

b. Sheila and Eric were each doing a string-art project. Sheila's pattern called for 229 nails. Eric's pattern needed 284 nails. How many nails did they need altogether? (Estimate first and then find the exact answer.)

Estimate	**Exact**

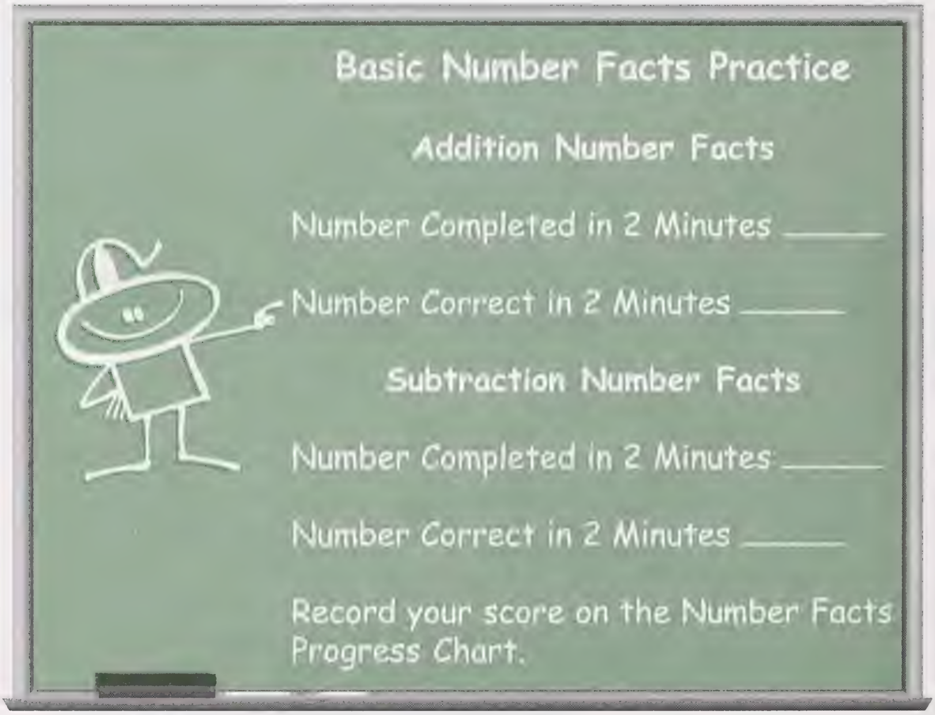
c. A family drove from Edmonton to Vancouver. On Monday they travelled 445 km. On Tuesday they travelled 505 km. On Wednesday they travelled 294 km. How many kilometres did they travel in all? (Find the exact sum first and then estimate to check the sum.)

Exact	**Estimate**

Check your answers in the Appendix.

Basic Number Facts Practise

Ask your home instructor to time you as you complete the following exercises. Your goal is to complete all 25 questions in each exercise in 2 minutes. At the end of 2 minutes, count up how many questions you were able to complete. Write this number in the chart below. Then use the answer key in the Appendix to mark the exercise, and record your score in the space provided. Before you move on, go back and complete any questions you did not finish during the 2 minutes. Mark these questions using the answer key as well.



Basic Number Facts Practice

Addition Number Facts

Number Completed in 2 Minutes ______

Number Correct in 2 Minutes ______

Subtraction Number Facts

Number Completed in 2 Minutes ______

Number Correct in 2 Minutes ______

Record your score on the Number Facts Progress Chart.

6. Addition Number Facts
Timed Exercise: 2 minutes

$\begin{array}{r} 8 \\ +\ 6 \\ \hline \end{array}$ $\begin{array}{r} 9 \\ +\ 9 \\ \hline \end{array}$ $\begin{array}{r} 9 \\ +\ 3 \\ \hline \end{array}$ $\begin{array}{r} 7 \\ +\ 7 \\ \hline \end{array}$ $\begin{array}{r} 6 \\ +\ 7 \\ \hline \end{array}$

$9 + 7 =$ $9 + 4 =$ $8 + 5 =$ $8 + 7 =$ $5 + 9 =$

$\begin{array}{r} 7 \\ +\ 5 \\ \hline \end{array}$ $\begin{array}{r} 8 \\ +\ 8 \\ \hline \end{array}$ $\begin{array}{r} 7 \\ +\ 9 \\ \hline \end{array}$ $\begin{array}{r} 5 \\ +\ 7 \\ \hline \end{array}$ $\begin{array}{r} 9 \\ +\ 6 \\ \hline \end{array}$

$7 + 8 =$ $9 + 8 =$ $7 + 6 =$ $6 + 9 =$ $8 + 9 =$

$\begin{array}{r} 6 \\ +\ 8 \\ \hline \end{array}$ $\begin{array}{r} 4 \\ +\ 8 \\ \hline \end{array}$ $\begin{array}{r} 5 \\ +\ 8 \\ \hline \end{array}$ $\begin{array}{r} 9 \\ +\ 5 \\ \hline \end{array}$ $\begin{array}{r} 6 \\ +\ 6 \\ \hline \end{array}$

Check your answers in the Appendix.

STOP

7. Subtraction Number Facts
Timed Exercise: 2 minutes

$$\begin{array}{r}16\\-\ \ 8\\\hline\end{array}\qquad\begin{array}{r}13\\-\ \ 8\\\hline\end{array}\qquad\begin{array}{r}14\\-\ \ 6\\\hline\end{array}\qquad\begin{array}{r}14\\-\ \ 8\\\hline\end{array}\qquad\begin{array}{r}15\\-\ \ 7\\\hline\end{array}$$

$$12-5= \qquad 12-9= \qquad 18-9= \qquad 12-7= \qquad 15-9=$$

$$\begin{array}{r}13\\-\ \ 9\\\hline\end{array}\qquad\begin{array}{r}13\\-\ \ 6\\\hline\end{array}\qquad\begin{array}{r}16\\-\ \ 9\\\hline\end{array}\qquad\begin{array}{r}15\\-\ \ 6\\\hline\end{array}\qquad\begin{array}{r}13\\-\ \ 4\\\hline\end{array}$$

$$17-9= \qquad 14-7= \qquad 17-8= \qquad 15-8= \qquad 13-5=$$

$$\begin{array}{r}12\\-\ \ 8\\\hline\end{array}\qquad\begin{array}{r}14\\-\ \ 5\\\hline\end{array}\qquad\begin{array}{r}13\\-\ \ 7\\\hline\end{array}\qquad\begin{array}{r}14\\-\ \ 9\\\hline\end{array}\qquad\begin{array}{r}16\\-\ \ 7\\\hline\end{array}$$

Check your answers in the Appendix.

Just For Fun

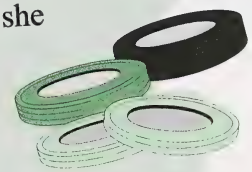
Play the addition game **"Four In a Row."**

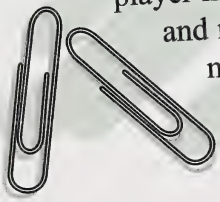
Number of players: 2

Materials:
- game board (See Day 4 of the Cut-Out Learning Aids.)
- 15 counters of one colour, 15 counters of another colour
- 2 paper clips

Object: to place four counters of the same colour in a row horizontally, vertically, or diagonally

How to play: Each player chooses the colour of counters he or she wants to use. The first player places the **two** paperclips on any two numbers in the box at the bottom of the game board. The two numbers added together give a sum that the player marks on the grid with one of his or her counters. The second player moves only **one** paper clip to a new number, adds the numbers, and marks the sum on the grid. Play continues with each player moving just **one** paper clip each turn until one player has four counters in a row. **Note:** Both paper clips may be placed on the same number to make a fact such as $4+4$ or $9+9$. Only one counter per grid square is allowed.





Turn to Assignment Booklet 4A, and complete the activities for Day 4.

Subtracting Whole Numbers

Subtraction of Two- and Three-Digit Numbers (No Regrouping)

When two- or three-digit numbers are subtracted, the common way to find the answer (the difference) is to subtract one column of digits at a time, beginning with the right-hand column (the ones) and moving to the left one column at a time.

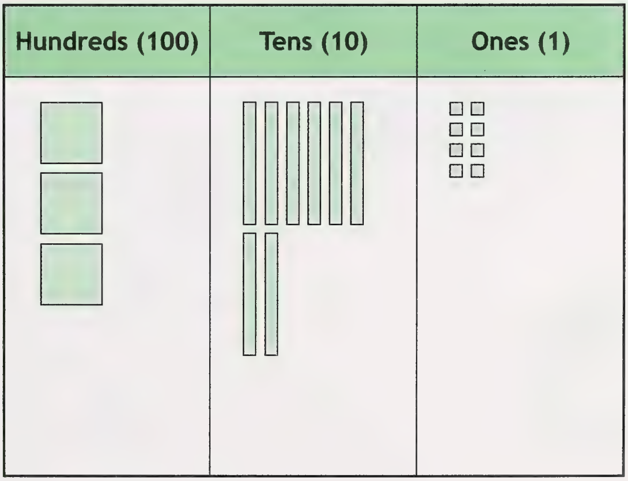
Example

Ellen collects stamps for a hobby. She has 388 stamps in all. Of these stamps, 165 are from Canada. How many of her stamps are from other countries?

Use your base ten blocks and your base ten mat from Day 3 to find the difference.

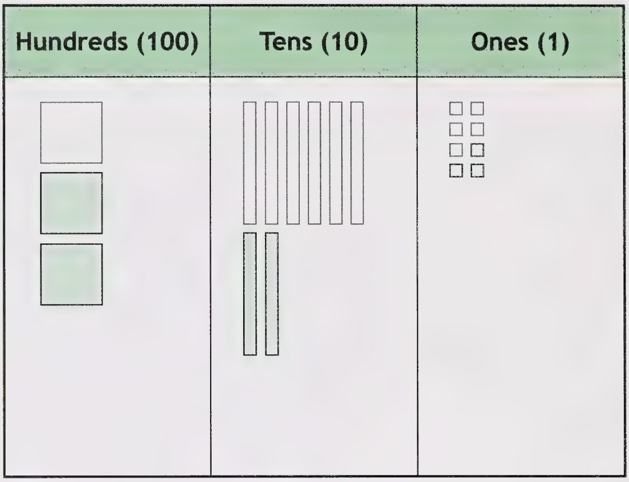
388 – 165 =

Show 388 as 3 hundreds, 8 tens, and 8 ones.



Subtract 165. First remove the ones, then the tens, and then the hundreds.

Count the remaining blocks.



The difference is 223.

Ellen has 223 stamps from other countries.

Subtract the ones.	Subtract the tens.	Subtract the hundreds.
$\begin{array}{r} 388 \\ -\ 165 \\ \hline 3 \end{array}$	$\begin{array}{r} 388 \\ -\ 165 \\ \hline 23 \end{array}$	$\begin{array}{r} 388 \\ -\ 165 \\ \hline 223 \end{array}$

There are other methods of subtraction that will give you the right answer. Perhaps you have discovered some of these other methods already. You will learn about other methods and strategies for subtraction in Day 6.

1. Find the following differences. Use your base ten blocks if you need to.

a. $\begin{array}{r} 965 \\ -\ 414 \\ \hline \end{array}$ **b.** $\begin{array}{r} 468 \\ -\ 353 \\ \hline \end{array}$ **c.** $\begin{array}{r} 837 \\ -\ 526 \\ \hline \end{array}$ **d.** $\begin{array}{r} 375 \\ -\ 35 \\ \hline \end{array}$ **e.** $\begin{array}{r} 694 \\ -\ 201 \\ \hline \end{array}$

Check your answers in the Appendix.

2. Solve each of the following story problems. Show your calculations and give a word answer for each.

   a. Jamir has 396 baseball cards. Greg has 273 cards. How many more baseball cards does Jason have than Greg?

   b. Alexis has 248 coins. Of these coins, 137 are dimes. How many coins are not dimes?

c. A school has 765 students. Of these students, 325 are girls. How many students are boys?

Check your answers in the Appendix.

Using Diagrams to Explain Subtraction

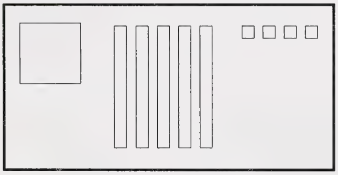
You can use diagrams to explain the process of subtraction, just like you did to help explain addition.

Example

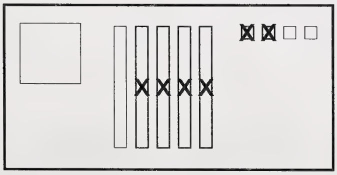
Tamil delivers 154 newspapers on her paper route. So far she has delivered 42 papers. How many more papers does she still have left to deliver?

Use base ten drawings to find the answer. If you wish, you may use your base ten blocks to help you with your drawings.

154 – 42 =



To show subtraction, simply use an X to cross out each base ten block you wish to subtract.



The difference is shown by the base ten blocks remaining: 1 hundred, 1 ten, and 2 ones.

The difference is 112.

Tamil has 112 papers left to be delivered.

3. For each of the following questions, use base ten drawings to show how the answer is found. Use your base ten blocks to help with your drawings if you need to.

a. $75 - 21 =$

b. $267 - 145 =$

c. $358 - 213 =$

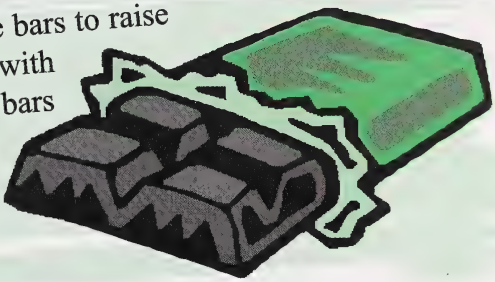
Check your answers in the Appendix.

Subtraction of Two- and Three-Digit Numbers (With Regrouping)

Use your base ten blocks and the base ten mat from Day 3 to follow along with this example.

Example

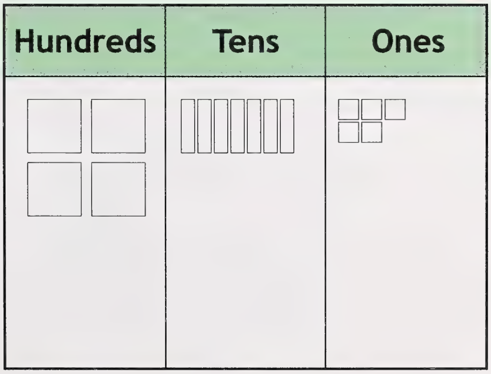
A Grade 4 class is selling chocolate bars to raise money for a field trip. They began with 475 chocolate bars. They sold 282 bars in the first week. How many more bars do they have left to sell?



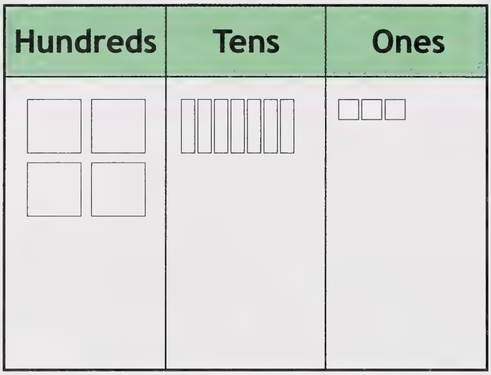
The arithmetic sentence needed to solve this problem is

475 – 282 =

- Show 475 by placing 4 hundreds, 7 tens, and 5 ones on the base ten mat.



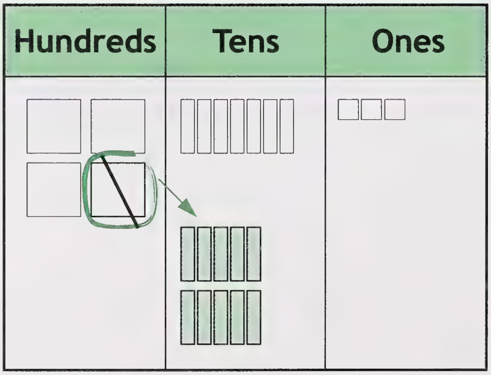
- To subtract 282, begin by subtracting the ones. Two ones are being subtracted from the 5 ones. Remove 2 ones from the Ones column on the mat. This leaves 3 ones.



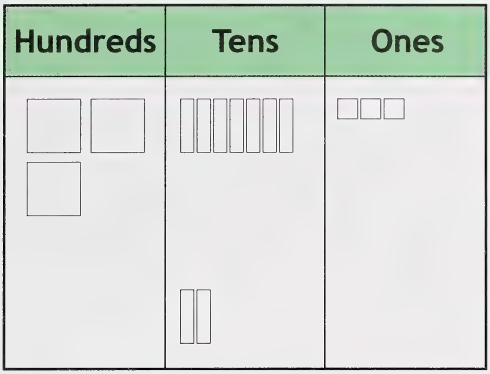
- Next, subtract the tens. Eight tens are being subtracted from 7 tens.

> Is this possible? Can you take 8 tens away from the mat if there are only 7 tens there?

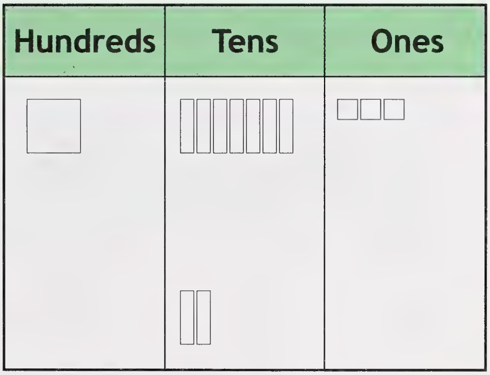
You can do this only if you regroup the hundreds (change one of the hundreds to tens). Show this by removing 1 hundred from the mat and exchanging it for 10 tens. Place the 10 tens in the Tens column with the other 7 tens. This will give you 17 tens.



Now you can remove 8 tens. This leaves 9 tens.



- Finally, subtract the hundreds. There are 3 hundreds left and you need to subtract 2 hundreds. Remove 2 hundreds from the mat. This leaves 1 hundred.



The difference is 193.

Using Diagrams to Explain Subtraction with Regrouping

Think back to what you just did with the manipulatives when you subtracted two- and three-digit numbers. Drawing diagrams to show subtraction when regrouping is involved is very similar.

Example

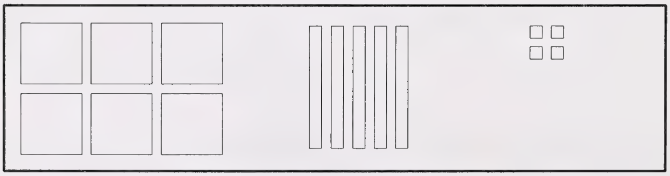
Rivertown Elementary School has 654 students. There are 386 students in Grades 1 to 3. How many students are in Grades 4 to 6?

Use base ten drawings to solve this problem.

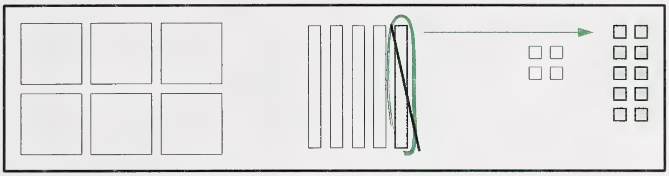
The arithmetic sentence for this problem is $654 - 386 =$.

Use a pencil and paper to make the following drawings yourself as you read through the steps.

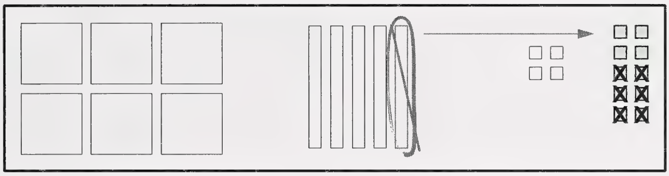
Begin by drawing the larger number.



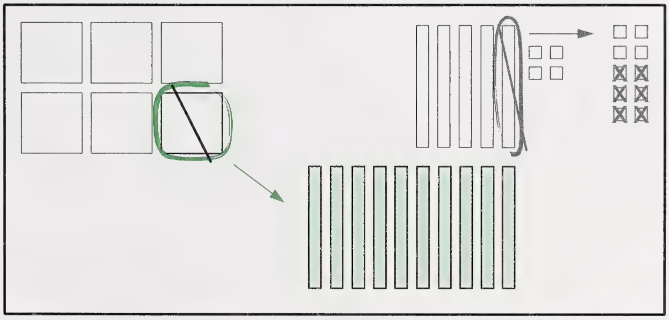
Starting with the ones, you'll see that you must subtract 6 ones. Since there are not enough ones to subtract 6 from, it will be necessary to regroup the tens, trading 1 ten for 10 ones. Show this with a circle and an arrow.



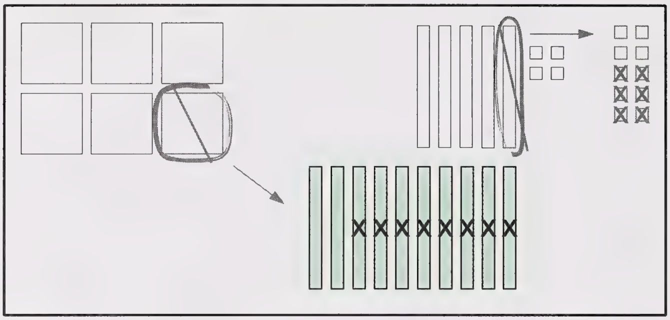
You now have 14 ones, so you are able to subtract 6 ones. Show this by drawing an X through each one you wish to subtract. This leaves 8 ones.



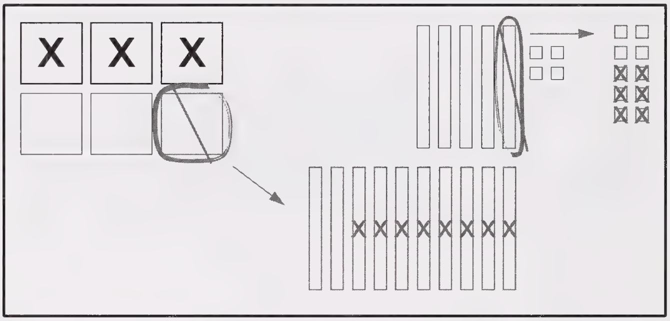
Next, subtract the tens. The problem asks you to subtract 8 tens. Since you have regrouped one of the tens, you have only 4 tens remaining. Again, before you can subtract, you need to regroup the hundreds by trading 1 hundred for 10 tens. This will give you 14 tens in all.



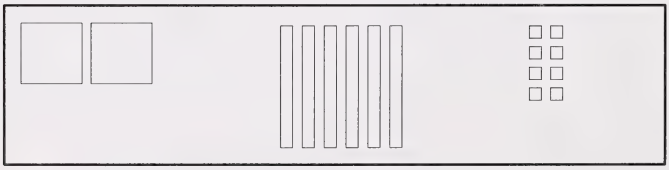
Now you can subtract the 8 tens. This is shown by crossing out each ten being subtracted. There are 6 tens remaining.



Finally, you subtract the hundreds. The problem asks you to subtract 3 hundreds. There are 5 hundreds remaining in the larger number. If you subtract 3 hundreds, you are left with 2 hundreds. No regrouping is necessary. Simply cross out the 3 hundreds.



The total number of base ten blocks remaining shows the answer to the problem.

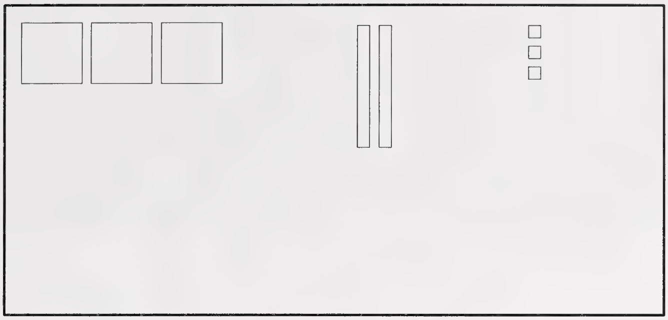


There are 2 hundreds, 6 tens, and 8 ones leftover. The answer is 268.

There are 268 students in Grades 4 to 6 at Rivertown School.

4. Regroup the base ten blocks in the following subtraction questions in order to find each difference.

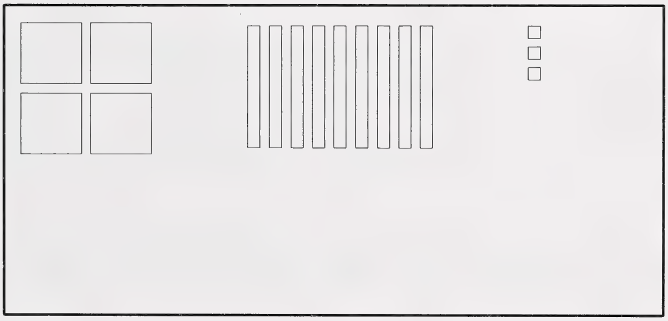
a.



Subtract 152.

= ____________________

b.

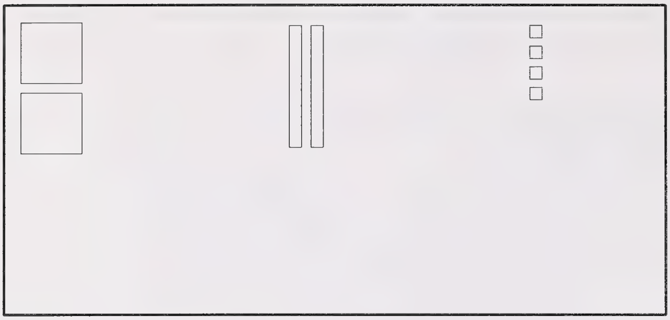


Subtract 278.

= ____________________

Check your answers in the Appendix.

c.



Subtract 148.

= ____________________

Check your answers in the Appendix.

5. Find the following differences.

a. $\begin{array}{r} 64 \\ -\ 27 \\ \hline \end{array}$

b. $\begin{array}{r} 564 \\ -\ 282 \\ \hline \end{array}$

c. $\begin{array}{r} 137 \\ -\ 49 \\ \hline \end{array}$

d. $\begin{array}{r} 425 \\ -\ 273 \\ \hline \end{array}$

e. $\begin{array}{r} 723 \\ -\ 469 \\ \hline \end{array}$

Check your answers in the Appendix.

Taking Another Look

The following activity is optional. You may choose to do it or not. You **should** complete the activity if you are still having difficulty with subtraction of two- and three-digit numbers.

If you choose **not** to do the questions at this time, you may wish to return here later to review subtraction before completing the review activities for Day 14.

Find each of the following differences.

1. $\begin{array}{r} 916 \\ -\ 457 \\ \hline \end{array}$

2. $\begin{array}{r} 854 \\ -\ 386 \\ \hline \end{array}$

3. $\begin{array}{r} 771 \\ -\ 473 \\ \hline \end{array}$

4. $\begin{array}{r} 682 \\ -\ 96 \\ \hline \end{array}$

5. $\begin{array}{r} 784 \\ -\ 375 \\ \hline \end{array}$

6. $\begin{array}{r} \$4.16 \\ -\ \$1.98 \\ \hline \end{array}$

7. $\begin{array}{r} 563 \\ -\ 386 \\ \hline \end{array}$

8. $\begin{array}{r} 98 \\ -\ 89 \\ \hline \end{array}$

9. $\begin{array}{r} 907 \\ -\ 268 \\ \hline \end{array}$

10. $\begin{array}{r} \$7.45 \\ -\ \$4.37 \\ \hline \end{array}$

Check your answers in the Appendix.

Turn to Assignment Booklet 4A, and complete the activities for Day 5.

Subtraction Strategies

Different Ways of Subtracting

In Day 5 you looked at the process of subtraction and how you can use base ten blocks or diagrams to show what happens when you subtract. You used the common method of starting with the ones column and moving left to each of the remaining place-value columns.

Perhaps you have discovered another way of subtracting. There are many methods for doing subtraction, just as there are many methods for doing addition.

Turn to page 88 in your textbook. Read question 5 and discuss with your home instructor the two methods shown for subtracting.

- Compare your own method of subtracting to the methods shown.
- Show your home insturctor how you would solve the problem $836 - 598$. Do your subtraction in the space below.

1. Find the following difference **two** different ways.

$$\mathbf{461 - 293 =}$$

Method 1

Method 2

Check your answers in the Appendix.

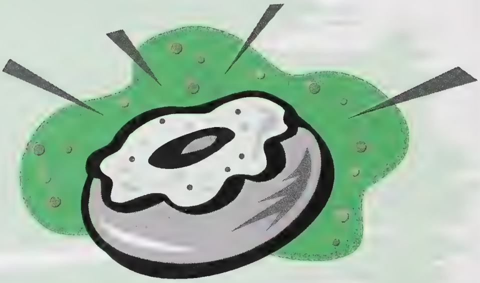
Using Estimation When Doing Subtraction

In Day 4, one of the addition strategies you learned was how estimation and rounding can be used to predict an approximate answer. You also looked at how estimation can be used to check if an answer you have calculated is reasonable.

Estimation can be used the same way for subtraction.

Example

Dinah's Doughnut Shop had 485 doughnuts to sell. By the end of the day, 199 doughnuts were left. How many doughnuts did Dinah sell that day?



Estimate the difference and then find the exact answer.

The arithmetic sentence to solve this problem is $485 - 199 =$.

To estimate the difference . . .	. . . round the numbers to the nearest hundred.	Then subtract the rounded numbers.
$\begin{array}{r} 485 \\ -\ 199 \\ \hline \end{array}$	$485 \rightarrow 500$ $199 \rightarrow 200$	$\begin{array}{r} 500 \\ -\ 200 \\ \hline 300 \end{array}$

The estimated difference for $485 - 199$ is 300. The exact difference for $485 - 199$ is 286.

Estimated difference:
$$\begin{array}{r} 500 \\ -\ 200 \\ \hline 300 \end{array}$$

Exact difference:
$$\begin{array}{r} 485 \\ -\ 199 \\ \hline 286 \end{array}$$

The estimated difference is close to the exact difference. This tells you that your answer is reasonable and probably correct.

2. Use rounding to estimate the difference for each question. Then find the exact answer.

a. $81 - 38$

Estimate	**Exact**

b. $785 - 266$

Estimate	**Exact**

c. $572 - 164$

Estimate	**Exact**

3. Use rounding to estimate the answer to each story problem. Use the word "about" in your word answer to show the answer is not exact.

   a. Mitchell has 376 comic books. Josh has 297 comic books. About how many more comic books does Mitchell have than Josh?

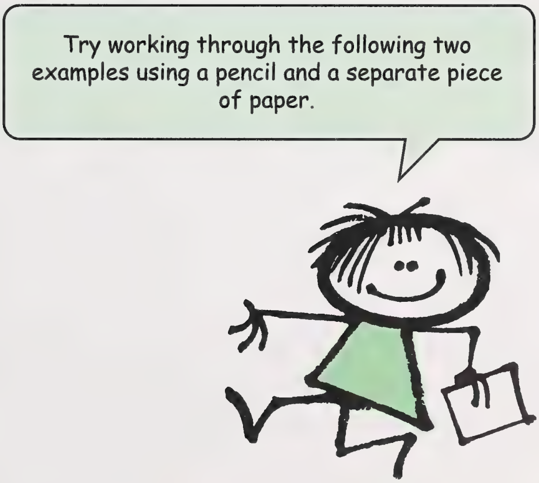
   b. A rancher had 484 cattle on his ranch. He sold 175 of them. About how many cattle are left?

c. Gina's class read 482 books during the school Read-a-Thon. Petra's class read 265 books. About how many more books did Gina's class read than Petra's class?

Check your answers in the Appendix.

Subtracting Across Zero

Sometimes when you subtract, it is necessary to regroup across more than one place-value column. This occurs when there are one or more zeros in the number on top.


Try working through the following two examples using a pencil and a separate piece of paper.

Example 1

$607 - 138 =$

In this question, you must regroup in order to get enough ones on top to subtract the 8 ones below.

$$\begin{array}{r} 607 \\ -\ 138 \\ \hline \end{array}$$

You cannot borrow from the tens column because the tens column has a zero. First, you need to regroup the hundreds by trading 1 hundred for 10 tens. Then add the 10 tens to the tens column.

$$\begin{array}{cccc} & 5 & 10 & \\ & \cancel{6} & \cancel{0} & 7 \\ - & 1 & 3 & 8 \\ \hline \end{array}$$

Next, borrow from the tens. To do this, you regroup the tens by trading 1 ten for 10 ones. This leaves 9 tens. You then add 10 ones to the ones column, making 17 ones.

$$\begin{array}{cccc} & & 9 & \\ & 5 & \cancel{10} & 17 \\ & \cancel{6} & \cancel{0} & \cancel{7} \\ - & 1 & 3 & 8 \\ \hline \end{array}$$

Finally, you subtract.

$$\begin{array}{cccc} & & 9 & \\ & 5 & \cancel{10} & 17 \\ & \cancel{6} & \cancel{0} & \cancel{7} \\ - & 1 & 3 & 8 \\ \hline & 4 & 6 & 9 \end{array}$$

The difference is 469.

Example 2

$\mathbf{400 - 154 =}$

There are not enough ones on top to subtract the 4 ones below.

$$\begin{array}{r} 400 \\ -\ 154 \\ \hline \end{array}$$

You can't borrow from the tens, so you must borrow from the hundreds. Trade 1 hundred for 10 tens. Then add the 10 tens to the tens column.

$$\begin{array}{cccc} & 3 & 10 & \\ & \cancel{4} & \cancel{0} & 0 \\ - & 1 & 5 & 4 \\ \hline \end{array}$$

Borrow from the tens. Trade 1 ten for 10 ones. Add the 10 ones to the ones column.

$$\begin{array}{r} \overset{3}{\cancel{4}}\,\overset{\overset{9}{\cancel{10}}}{\cancel{0}}\,\overset{10}{\cancel{0}} \\ -\ 1\,5\,4 \\ \hline 2\,4\,6 \end{array}$$

The difference is 246.

4. Find each of the following differences.

a. $\begin{array}{r} 503 \\ -\ 247 \\ \hline \end{array}$ **b.** $\begin{array}{r} 700 \\ -\ 355 \\ \hline \end{array}$ **c.** $\begin{array}{r} 606 \\ -\ 189 \\ \hline \end{array}$

Check your answers in the Appendix.

Checking Subtraction Problems

You can check your answers to subtraction problems by using the **reverse operation**. The reverse operation for subtraction is **addition**. To check a subtraction problem, add the two bottom numbers. If the answer is correct, the sum of the two bottom numbers must equal the top number.

Check

$$\begin{array}{r} 56 \\ -\ 24 \\ \hline 32 \end{array} \qquad \begin{array}{r} 24 \\ +\ 32 \\ \hline 56 \end{array}$$

5. For each question, check to see if the answer is correct by adding the two bottom numbers. If the answer is wrong, do the subtraction again to show the right answer.

a. $\begin{array}{r} 24 \\ -\ 17 \\ \hline 13 \end{array}$ **Check**

b. $\begin{array}{r} 353 \\ -\ 39 \\ \hline 314 \end{array}$ **Check**

c. $\begin{array}{r} 416 \\ -\ 128 \\ \hline 298 \end{array}$ **Check**

Check your answers in the Appendix.

6. For each question, find the difference. Then check by adding.

a. $\begin{array}{r} 156 \\ -\ 93 \\ \hline \end{array}$ **Check**

b. $\begin{array}{r} 562 \\ -\ 453 \\ \hline \end{array}$ **Check**

c. $\begin{array}{r} 404 \\ -\ 139 \\ \hline \end{array}$ **Check**

Check your answers in the Appendix.

7. The reverse operation for checking subtraction questions is addition. Can you guess what the reverse operation for checking addition questions is? Tell why you think so.

Check your answer in the Appendix.

8. Find the answer for each question. Then use the reverse operation to check that your answer is correct.

		Check			Check			Check
a.	218 + 437		**b.**	430 − 394		**c.**	567 + 75	

Check your answers in the Appendix.

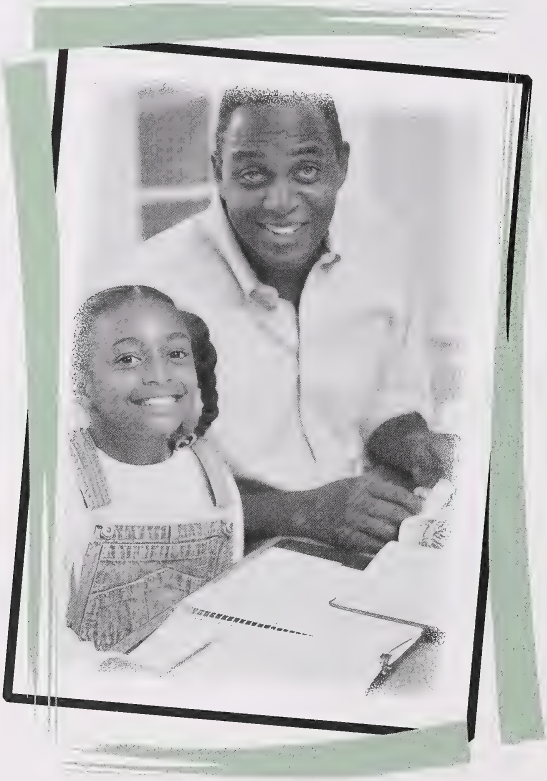
Turn to Assignment Booklet 4A, and complete the activities for Day 6.

Assessing What You Know (I)

Today is the last day you will be working in Section 1. You will complete four activities in Assignment Booklet 4A:

- Showing What You Can Do
- Basic Number Facts
- Adding and Subtracting Test
- Journal Entry

Read the explanation of the activities in Parts 1, 2, 3, and 4 before turning to Assignment Booklet 4A. Note that you will need the help of your home instructor for the activities in Parts 1 and 2.



Part 1: Showing What You Can Do

For this activity you will need the help of your home instructor. You will be working on a short activity while your home instructor observes you. As you work through the problem, try to explain clearly what you are doing.

Your home instructor may ask you questions such as the following:

- “How do you know that?”
- “Why did you decide to do that?”
- “How did you get that answer?”

Your job is to explain what you are doing so that your home instructor can understand your thinking.

Note to the Home Instructor

This performance assessment should take about 10 minutes. The Home Instructor’s Assessment Page and accompanying Student’s Assessment Page can be found in Day 7 of Assignment Booklet 4A. Remove both pages from the Assignment Booklet. Read over the student’s page so you are familiar with the student’s assigned task. You should also preview the interview questions and the checklist before the student begins working on the assigned task.

As the student works to answer the questions, encourage him or her to talk about what he or she is doing. **Allow the student to use any manipulatives or cut-out learning aids available to help solve the problem**. You may or may not wish to use some of the interview questions. Look for understanding and the student’s ability to explain clearly what he or she is doing to arrive at an answer. Indicate on the checklist whether you feel the student demonstrated the skills being assessed.

Attach both assessment pages to the Assignment Booklet before sending it in for marking.

Part 2: Basic Number Facts

In this activity you will show how well you are doing at learning your basic number facts for addition and subtraction. Your home instructor will time you as you do each test.

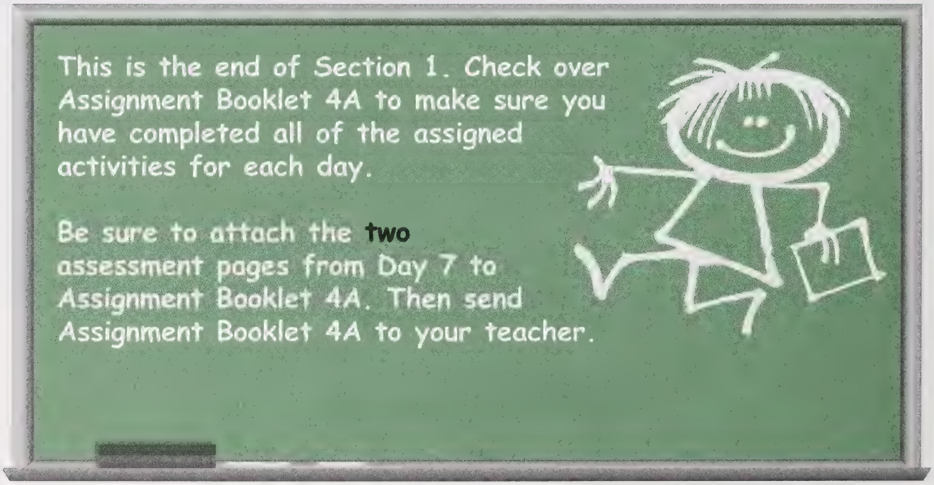
Part 3: Adding and Subtracting Test

For this activity, you are to complete the 15 questions on your own, without help from your home instructor. Do all calculations on the page. Do NOT use a calculator.

Part 4: Journal Entry

Complete this activity in Day 7 of Assignment Booklet 4A.

When your home instructor is ready, turn to Assignment Booklet 4A and complete the activities found in Parts 1, 2, 3 and 4 of Day 7.



This is the end of Section 1. Check over Assignment Booklet 4A to make sure you have completed all of the assigned activities for each day.

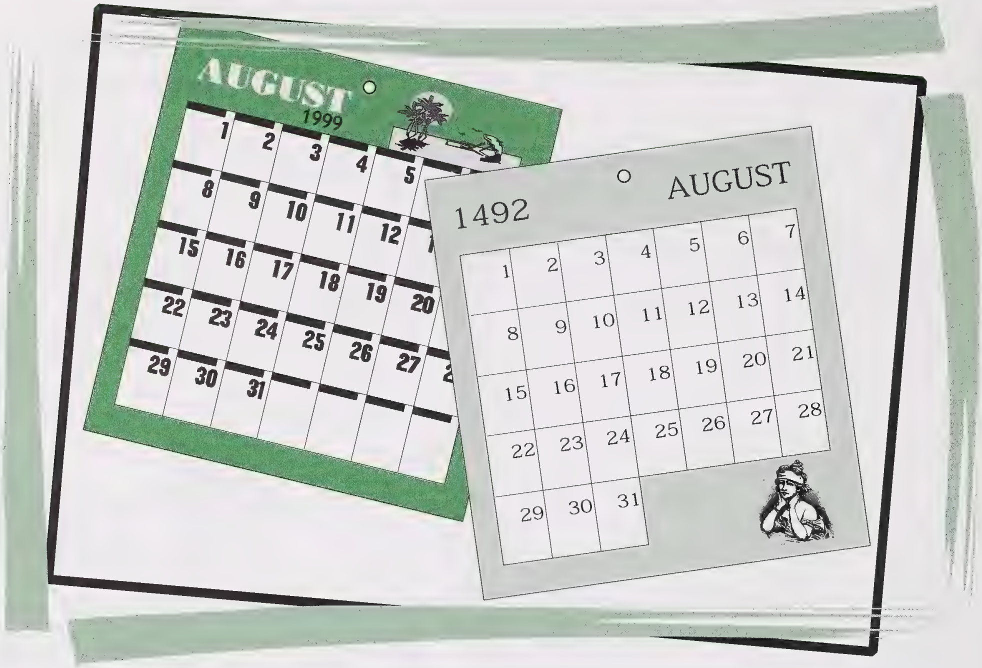
Be sure to attach the **two** assessment pages from Day 7 to Assignment Booklet 4A. Then send Assignment Booklet 4A to your teacher.

Section 2

Extending Your Adding and Subtracting Skills

Day 8 𝍸 III

Adding and Subtracting Large Numbers



Have you ever wished you could travel back through time? Wouldn't it be fun to see Columbus arriving in the New World or knights jousting in a tournament? Or, perhaps you would like to visit the great kings who ruled Egypt and built pyramids. How many years back in time would you choose to go?

Suppose you went back to the year 1492. How many years back in time would that be? Can you calculate that in your head? Would you use paper and pencil? Perhaps you would look for your calculator.

Today you will look at how to work with large numbers in addition and subtraction. All of the addition and subtraction strategies that you have learned so far can also be used for larger numbers. Regrouping, subtracting across zero, rounding, estimating, and using the reverse operation to check answers are all useful strategies whether the numbers are large or small.

Regrouping with Large Numbers

Addition

Remember: When you add, you cannot have a number greater than 9 in any place-value column. Instead, you must regroup and shift left to the next place-value column to write part of the number.

Example

There are 28 calves in a pen. If 9 more calves are added, how many are now in the pen?

$$\begin{array}{r} {}^{1} \\ 28 \\ +\ \ 9 \\ \hline 37 \end{array}$$

Add the ones: $8+9=17$. The number 17 cannot be written in the ones column.

Instead, regroup 17: $17=1$ ten $+\,7$ ones.

Put 7 in the ones column. Put the 1 ten at the top of the tens column.

Add the tens: $1+2=3$.

The answer is 37. There are now 37 calves in the pen.

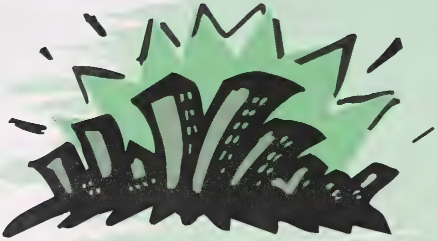
1. Find the sum for each question.

a. $\begin{array}{r} 48 \\ +\ 23 \\ \hline \end{array}$ **b.** $\begin{array}{r} 37 \\ +\ 96 \\ \hline \end{array}$ **c.** $\begin{array}{r} 893 \\ +\ 58 \\ \hline \end{array}$ **d.** $\begin{array}{r} 545 \\ +\ 676 \\ \hline \end{array}$

Check your answers in the Appendix.

You can also use this strategy for regrouping when you add large numbers.

Example



Two small towns located close together have decided to join into one larger town. Town A has a population of 2441. Town B has a population of 3834. What will be the total population of the new town?

In the example, $4+8=12$ hundreds. The 12 hundreds must be regrouped. (Trade 10 hundreds for 1 thousand.)

$$\begin{array}{r} 2\overset{1}{\mathbf{4}}41 \\ +\ 3\mathbf{8}34 \\ \hline 6\mathbf{2}75 \end{array}$$

The total population of the new town will be 6275.

2. Find the sum for each question.

a. $\begin{array}{r} 1348 \\ +\ 6724 \\ \hline \end{array}$ **b.** $\begin{array}{r} 6031 \\ +\ 3779 \\ \hline \end{array}$ **c.** $\begin{array}{r} 7459 \\ +\ 456 \\ \hline \end{array}$ **d.** $\begin{array}{r} 2211 \\ +\ 999 \\ \hline \end{array}$

Check your answers in the Appendix.

Subtraction

When you subtract, always make sure the digit on top is large enough to subtract the digit below it. If it's not, then you must regroup by trading.

Example

This year's attendance at River Town's Fair Days was 7684. This was an increase of 2853 over last year. How many people attended the fair last year?

In the calculation for this example, the hundreds digit on top is not large enough to subtract the number below it. Trading 1 thousand for 10 hundreds gives you enough hundreds to subtract the 8 below.

$$\begin{array}{r} \overset{6}{\cancel{7}}\overset{16}{\cancel{6}}84 \\ -\ 2853 \\ \hline 4831 \end{array}$$

Last year's fair was attended by 4831 people.

3. Find the difference for each question.

a. $\begin{array}{r} 4882 \\ -\ 2795 \\ \hline \end{array}$ **b.** $\begin{array}{r} 7184 \\ -\ 486 \\ \hline \end{array}$ **c.** $\begin{array}{r} 6671 \\ -\ 2595 \\ \hline \end{array}$ **d.** $\begin{array}{r} 5111 \\ -\ 4899 \\ \hline \end{array}$

Check your answers in the Appendix.

In Day 6 you looked at regrouping when there were one or two zeros in the top number. You learned how to regroup across zeros. The same strategy works for larger numbers when there are three or more zeros in the top number.

Look at the following calculation. How many regroupings do you see?

$$\begin{array}{rcccc} & & 9 & 9 & \\ & 7 & \cancel{10} & \cancel{10} & 10 \\ & \cancel{8} & \cancel{0} & \cancel{0} & \cancel{0} \\ - & 4 & 7 & 7 & 2 \\ \hline & 3 & 2 & 2 & 8 \end{array}$$

Notice that when you regroup across three zeros, you first trade 1 thousand for 10 hundreds and add the 10 hundreds to the hundreds column. Then you cross out the 10 and write 9 to show you are trading 1 of the hundreds for 10 tens. (You then put the 10 tens in the tens column, and so on.)

4. Find the difference for each question.

a. $\begin{array}{r} 2000 \\ -\ 1286 \\ \hline \end{array}$ **b.** $\begin{array}{r} 8050 \\ -\ 4362 \\ \hline \end{array}$ **c.** $\begin{array}{r} 3007 \\ -\ 264 \\ \hline \end{array}$ **d.** $\begin{array}{r} 6108 \\ -\ 2849 \\ \hline \end{array}$

Check your answers in the Appendix.

Just For Fun

Play the game **"Sum Fun."**

Number of players: 2 or more

Materials:
- number cards 0 to 9 (See Day 8 of the Cut-Out Learning Aids section in the Appendix.)
- Sum Fun recording sheet for each player
- pencil for each player

Object: to create the largest sum when two four-digit numbers are added together

How to play: Each player needs a Sum Fun recording sheet and a pencil. The number cards are shuffled and placed face-down in a pile. One player draws the top card and places it face-up next to the pile. Each player writes the number from the card in one of the boxes on his or her recording sheet. Players continue to draw the top card, turn it over, and record the number in the box until all of their boxes are filled. Then each player adds the two four-digit numbers. Players check each other's calculations to be sure who has the largest sum. The player with the largest sum scores one point. Players repeat the game until someone reaches ten points.

Variation: Use a deck of playing cards instead of the number cards in the Appendix. Remove the jacks, queens, and kings. This will leave 40 cards in the deck. An ace will stand for one and ten will stand for zero.

More Practice with Estimation

In Day 4 you saw how estimation can be used to predict what an answer should be close to. You also saw how estimation can be used to check an answer to see if it is reasonable.

5. In the following story problems, round to the nearest **thousand** to estimate the sum or difference. Use the word “about” in your word answer.

a. On Friday, 7884 people attended a baseball game. On Saturday, 5126 people attended another game. About how many more people attended the game on Friday than on Saturday?

b. A count of the vehicles on a busy city street showed the three days with heaviest traffic:

• Monday	3409 vehicles
• Thursday	2658 vehicles
• Friday	2166 vehicles

About how many vehicles travelled on this street during the three days?

c. Mr. DaCosta had $2895 in his bank account at the end of October. At the end of November, he had $5062. About how much money did he deposit into his account in November?

Check your answers in the Appendix.

Checking by Using the Reverse Operation

6. Use the reverse operation to check your answer for each of the following questions.

Check

a.
$$\begin{array}{r} 3864 \\ +\ 4237 \\ \hline \end{array}$$

Check

b.
$$\begin{array}{r} 4068 \\ -\ 629 \\ \hline \end{array}$$

Check

c.
$$\begin{array}{r} 6000 \\ -\ 1825 \\ \hline \end{array}$$

Check

d.
$$\begin{array}{r} 1398 \\ +\ 7685 \\ \hline \end{array}$$

Check your answers in the Appendix.

Mental Math

Strategy: Adjusting Large Numbers

7. a. Show the method you would use to find the answer to this question.

$$\begin{array}{r} 3002 \\ -\ 1999 \\ \hline \end{array}$$

Check your answer in the Appendix.

You probably remember from Days 5 and 6 that the common way of doing questions like these is regrouping and trading so that each digit in the top number is large enough to subtract the digit below it. Perhaps this is what you did in question 7.a.

Here is a way to calculate the answer in your head, without even using a pencil! Look at each number.

3002 – 1999 = ☐

b. What number is 1999 very close to? ________________

Check your answer in the Appendix.

It’s easy to subtract 2000 in your head.

$3000 - 2000 = 1000$
$3002 - 2000 = 1002$

To subtract using 1999 instead of 2000, simply add 1 to the answer (1002).

$3002 - 1999 = 1003$ ← Since the number being subtracted is 1 smaller, the answer will be 1 bigger. $(1002 + 1 = 1003)$

Now try this with smaller numbers to be sure you understand.

$32 - 9 =$

c. What number is 9 close to? ________________

d. Instead of 9, use 10 as the number being subtracted.

$32 - 10 =$ ________________

e. When you subtract 10, the answer is 22.

If you subtract a smaller number (such as 9), will the answer be bigger or smaller? ________________

Check your answers in the Appendix.

f. What would the answer be if the small number being subtracted was 8 instead of 10?

$32 - 8 = \square$

$32 - 10 = 22$
$32 - 8 =$ ____________

Since 8 is 2 less than 10, the answer would be bigger by 2. $(22 + 2 = ?)$

Check your answer in the Appendix.

Note to the Home Instructor

If the student is experiencing difficulty with the concepts presented here, it may be helpful to use base ten manipulatives (either cut-out models or blocks). Counters such as buttons or coins could also be used. Have the student show what happens when 10 is subtracted from a number, and then predict and show what happens when only 9 is subtracted. (The answer would be greater by 1.) Similarly, the student could predict what the answer would be when 8 is subtracted, and then demonstrate with base ten blocks. (e.g., $56 - 10 = ?$, $56 - 9 = ?$, $56 - 8 = ?$)

The preceding examples were both subtraction questions. The same mental arithmetic strategies also apply to addition.

Example 1

$3295 + 2002 = \square$

To do this in your head, think: $3295 + 2000 = 5295$

$3295 + 2002$ will be bigger by 2. $(5295 + 2 = ?)$

Therefore, $3295 + 2002 = 5297$

Example 2

$4999 + 2999 =$

To do this in your head, think: 4999 is 1 less than 5000.

2999 is 1 less than 3000.

$5000 + 3000 = 8000$

$4999 + 2999$ will be smaller by 2. $(8000 - 2 =$

Therefore, $4999 + 2999 = 7998$

8. Use mental math to find each sum or difference.

a. $30 + 12 =$ ________

b. $49 + 50 =$ ________

c. $67 - 9 =$ ________

d. $93 - 11 =$ ________

e. $3005 + 1000 =$ ________

f. $8008 - 2000 =$ ________

g. $4782 - 1999 =$ ________

h. $2967 + 4999 =$ ________

i. $5600 + 3004 =$ ________

j. $6000 - 2001 =$ ________

Check your answers in the Appendix.

Taking Another Look

The following activities are optional. You may choose to do them or not. You **should** complete the activities if you are still having difficulty with addition or subtraction, or if you simply wish to improve your speed and accuracy in these two operations.

If you choose **not** to do the activities at this time, you may wish to return here later to review addition and subtraction before completing the review activities for Day 14.

Turn to page 89 in your textbook. Do questions 1 to 18 in Practise Your Skills.

1. **2.** **3.** **4.** **5.**

6. **7.** **8.** **9.** **10.**

11. **12.** **13.** **14.** **15.**

16. **17.** **18.**

Check your answers in the Appendix.

Turn to pages 90 and 91 in the textbook. Play “The Quick Addition Game.”

This is a game for two players. Each player needs paper, a pencil, and a recording sheet. The recording sheet can be found in Day 8 of the Cut-Out Learning Aids section of the Appendix. A calculator is also necessary for checking answers. Players must make up their own addition and subtraction problems that use four-digit numbers. To play this game, follow the game rules found on page 91 of the textbook.

Turn to Assignment Booklet 4B, and complete the activities for Day 8.

Problem Solving

Problem-Solving Strategies

So far in Mathematics 4 you have been introduced to the four-step method of problem solving and you have looked at several strategies. Today you will look at another problem-solving strategy that can be used to solve a variety of problems.

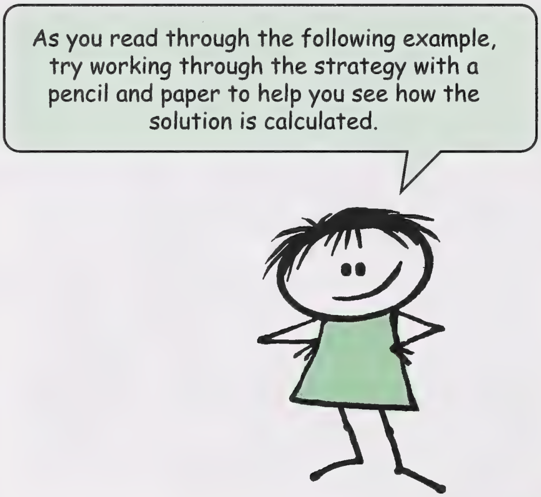
Remember that no one strategy can be used to solve all problems. Also remember that most problems can be solved using different strategies. As a result, when two people work on the the same problem, one person's method of solving the problem could be very different from the method used by the other person.

Don't be afraid to try solving problems a second time using another strategy (even if you already know the answer). In this way, you will become familiar with many strategies and you may even learn to combine them when necessary.

Keep reviewing the strategies you have learned. A description of the problem-solving strategies introduced in Grade 4 can be found in the Appendix in Module 1. You may refer to the strategies at any time throughout the year if you need help learning to use any of them.

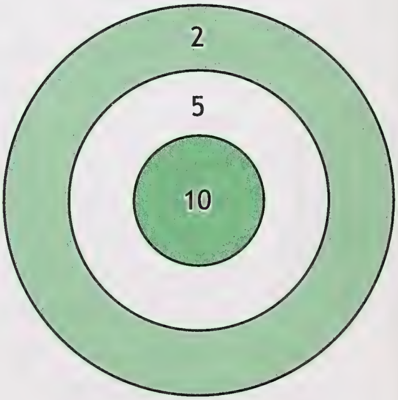
Problem-Solving Strategy: Making a List

Sometimes a problem asks you to find all of the combinations, or to list all or as many of the possibilities as you can. In order to keep track of all of the data, it is helpful to list data in an organized way. This will help you make sure you have found all of the possibilities and will also help you avoid listing items twice.


As you read through the following example, try working through the strategy with a pencil and paper to help you see how the solution is calculated.

Example 1

Amal threw three darts at the target shown. All three darts hit the target. List all the possible point totals that Amal could have made with his three darts.



Step 1: Understand the problem.

Think: I need to find all the different ways the three darts could have landed. If I add the points for all three darts, it will give me the point totals.

Step 2: Make a plan. (Choose a strategy.)

One way to solve this problem would be to make a list showing all the different totals that are possible with three darts on a target with three rings.

Step 3: Try the plan.

To make sure that you find all the possible point totals, you need to record your data in an organized way. In this problem, the order in which the darts hit the target does not matter. You are interested only in the total points for each throw of three darts.

One way to organize the totals is to look at the number of darts that hit the centre ring or bull's-eye. What would the point totals be if all three darts hit the bull's-eye? What if only two darts hit the bull's-eye? What if only one did? What if none did?

	Possible Point Totals
3 darts hit bull's-eye	$10 + 10 + 10 = 30$
2 darts hit bull's-eye	$10 + 10 + 5 = 25$ $10 + 10 + 2 = 22$
1 dart hits bull's-eye	$10 + 5 + 5 = 20$ $10 + 2 + 5 = 17$ $10 + 2 + 2 = 14$
0 darts hit bull's-eye	$5 + 5 + 5 = 15$ $5 + 5 + 2 = 12$ $5 + 2 + 2 = 9$ $2 + 2 + 2 = 6$

The list shows all the different point totals that Amal could have made. Ten different totals are possible.

ANSWER TO THE PROBLEM

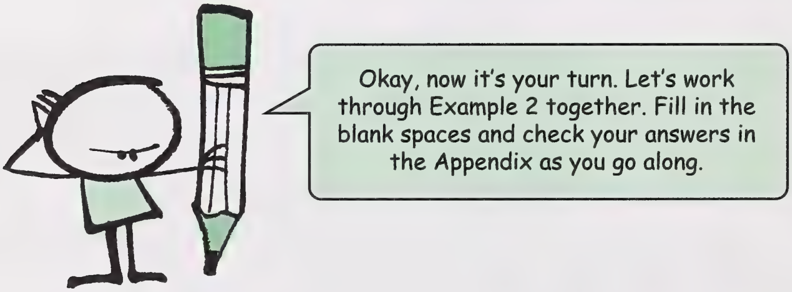
Amal could have made any one of the following point totals by throwing three darts at the target.

6, 9, 12, 14, 15, 17, 20, 22, 25, or 30

Step 4: Look back.

Read the problem again. Then ask yourself the following questions:

- Have I answered the question being asked? Check over your addition calculations to make sure each of the point totals is added correctly.
- Is my answer reasonable, based on the information given in the problem? For example, does it seem reasonable that a person throwing three darts could get a score as low as 6 and as high as 30?


Okay, now it's your turn. Let's work through Example 2 together. Fill in the blank spaces and check your answers in the Appendix as you go along.

Example 2

The Wilson family is planning a trip to the mountains. They could travel by train, by bus, or by car. They will visit one park: either Jasper National Park or Banff National Park. They will stay in either a motel or a campground. What are all the different trips that the Wilsons could plan?

Step 1: Understand the problem.

1. What is the Wilson family doing? ______________________________

____

2. How many choices are there for ways to travel? ________________

List them. ______________________________________

____

3. How many choices are there for parks to visit? ____________________

   List them. ____

   ____

4. How many choices are there for places to stay? ____________________

   List them. ____

   ____

5. What is the question in the problem asking you to find? ____________

   ____

   ____

Check your answers in the Appendix.

Step 2: Make a plan. (Choose a strategy.)

One way to solve this problem would be to make an organized list of all the different trip combinations.

6. This is called the ______________________________ strategy.

7. What three things must each possible trip include?

   - ____
   - ____
   - ____

Check your answers in the Appendix.

Step 3: Try the plan.

Since there are three things that can change for each trip combination, you will need to make a list with three headings. Write **Way to Travel**, **Park to Visit**, and **Place to Stay** as headings on the top line of the following list.

Trip Combinations

ANSWER TO THE PROBLEM

You could begin with any column, but start with **Way to Travel** for now.

- Write **train** on the first line below the heading.
- Move to the next column, **Park to Visit**. There are two choices: Jasper or Banff. Write **Jasper**.
- Move to the next column, **Place to Stay**. There are two choices: motel or campground. Write **motel**.

Your first line should look like this:

train **Jasper** **motel**

This is one of the trip combinations that the Wilsons could plan.

For the next trip, use the same way to travel (train) and the same park to visit (Jasper).

- Write **train** and **Jasper** in the correct spaces on the second line.

8. Is there another place to stay instead of a motel?

____

- Write **campground** in the correct space on the second line.

Your second line now shows another possible trip combination.

train **Jasper** **campground**

9. If you keep the **Way to Travel** and the **Park to Visit** the same, is there another kind of place to stay?

____

Check your answers in the Appendix.

In order to make another trip combination, you must change another column.

If you use the same **Way to Travel** and change the **Park to Visit**, you can make two more trips.

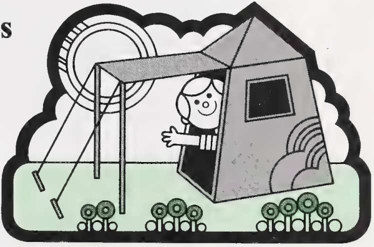
- Use **train** and **Banff** to create two more trips on your list. Use a different place to stay for each trip.

10. How many different trip combinations do you have so far? ____________

Check your answers in the Appendix.

For the same **Way to Travel**, you have used two different **Parks to Visit** and two different **Places to Stay**.

You can probably guess what comes next. You go through the same steps again using a second way to travel, and then again using the third way to travel.



11. a. How many different trip combinations do you predict there will be?

____

b. Tell why you think so. ____________________________

____

____

12. Go back to the list and see how many more trip combinaitons you can make.

Check your answers in the Appendix.

Now it’s time to write the answer to the problem. The problem asks for all of the different trips the Wilsons could plan. You could rewrite all the trips from your list or write an answer like, “The Wilsons could plan twelve different trips. The twelve possible trips are given in the list above.”

13. Go back to the list and put your answer in the box labelled ANSWER TO THE PROBLEM.

Check your answers in the Appendix.

Step 4: Look back.

The first thing you should do is read the problem again. Ask yourself these questions:

- Have I answered the question that was asked?
- Did I use each way to travel, each park, and each place to stay the correct number of times?

Then check to see if your answer makes sense. Ask yourself, “Is my answer reasonable, based on the information given in the problem?”

Look back at your list and the answers you wrote.

Turn to Assignment Booklet 4B, and complete the activities for Day 9.

Adding and Subtracting Decimals (Tenths)

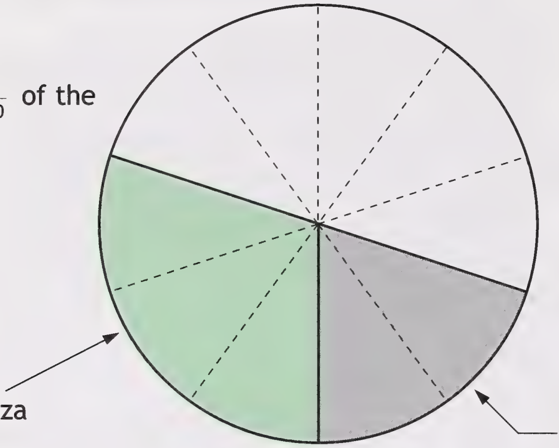
Think back to Module 3 and recall what you learned about decimals and fractions. You will be making use of those concepts as you work through today's lesson.

Reviewing Decimal Place Value (Tenths)

Steven and Betty ordered a pizza. Steven ate $\frac{3}{10}$ of the pizza. Betty ate 0.2 of the pizza. How many pieces of pizza were left?

In order to solve this problem, you need to know that a decimal number like 0.2 can also be shown as a fraction.

The pizza has 10 equal pieces.



Steven ate $\frac{3}{10}$ of the pizza.

Betty ate 0.2 of the pizza.

0.2 is the same as $\frac{2}{10}$.

$\frac{3}{10}$ of the pizza equals 3 pieces.

$\frac{2}{10}$ of the pizza equals 2 pieces.

Together Steven and Betty ate $\frac{5}{10}$ of the pizza. This is the same as 5 pieces. Therefore, there are 5 pieces of pizza left.

Look at the following figure. Note that part of the square is shaded. There are several ways to describe the amount of the square that is shaded.

Three tenths is shaded. (Words)

$\frac{3}{10}$ is shaded. (Fraction)

0.3 is shaded. (Decimal number)

To write three tenths as a decimal number, you can use the place-value chart.

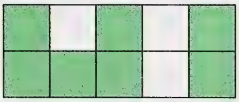
Hundreds	Tens	Ones	Tenths
		0.	3

The dot to the right of the Ones column is called the **decimal point**. A number that uses a decimal point is called a **decimal number**. When writing a decimal number, you should write a zero in the Ones column as a place holder. This shows that there are no other numbers to the left of the decimal point. It also shows that the number is less than 1.

The digit in the the Tenths column shows how many tenths there are. The number is read as “three tenths” or “zero decimal three.”

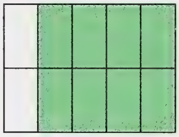
1. For each of the following, write a fraction and a decimal number for the shaded part.

a.



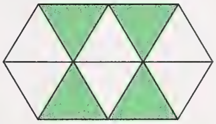
________, ________

b.



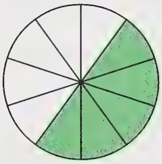
________, ________

c.



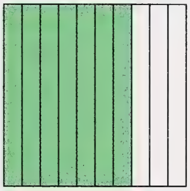
________, ________

d.



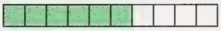
________, ________

e.



________, ________

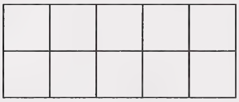
f.



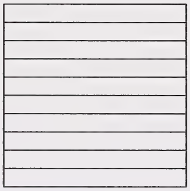
________, ________

2. Shade each figure to show the correct amount.

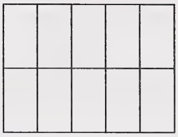
a. four tenths



b. 0.6

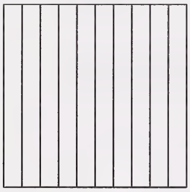


c. $\frac{9}{10}$



Check your answers in the Appendix.

3. The square below has ten sections. Each section is one tenth of the square.

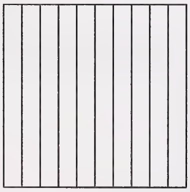


a. Shade in one section. The shaded section is one tenth of the square.

b. Write the fraction and the decimal number to show how much of the square is now shaded.

______________, ______________

4. Look at the following square.



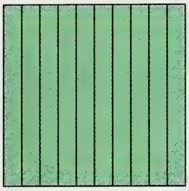
a. Shade in seven sections of the square.

b. Use words to tell what fraction of the square is now shaded.

____

Check your answers in the Appendix.

5. Now look at the next square.



a. How many sections are shaded? ________

b. Write the fraction that describes how much of the square is shaded.

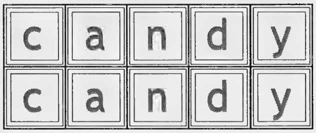
____

Check your answers in the Appendix.

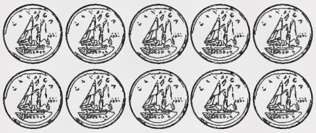
The fraction $\frac{10}{10}$ can be written as 1.0 or 1. In other words, all sections of the square, or **one** whole square, is shaded.

6. Shade $\frac{10}{10}$ of each of the following:

a.

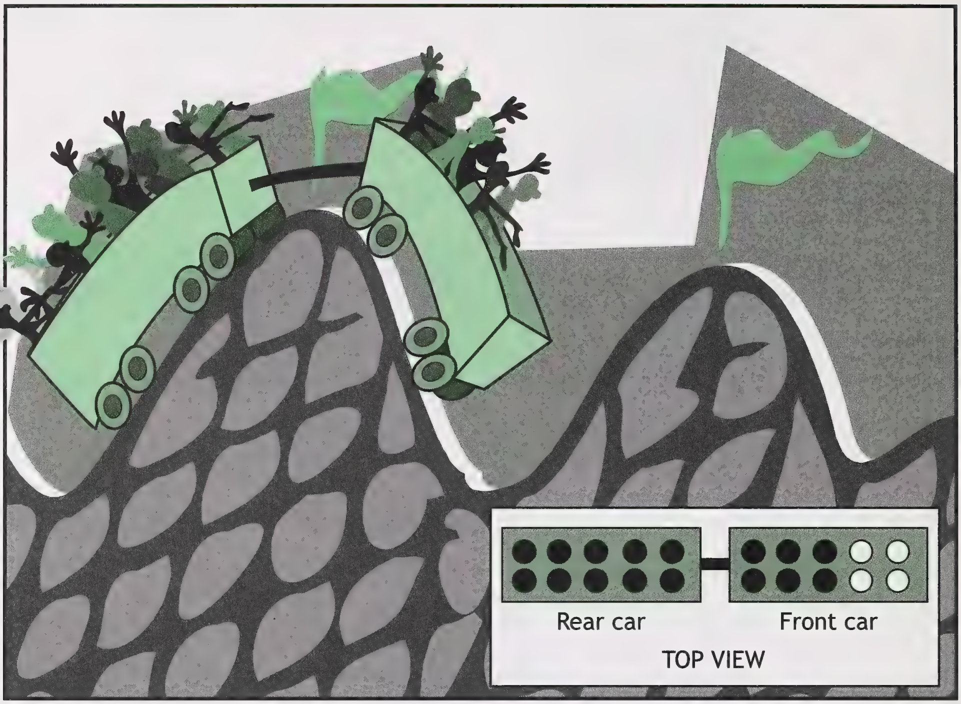

c a n d y
c a n d y

b.



Check your answers in the Appendix.

Decimal Numbers Greater Than One



7. a. How many riders can each roller coaster car hold? (**Hint:** Look at the box showing the "top view.") ____________

   b. What fraction tells how full the front car is? ____________

   c. What fraction tells how full the rear car is? ____________

Check your answers in the Appendix.

8. You can write the decimal fraction 1.6 to show how full the entire roller coaster train is.

   a. What does the **1** tell? ____

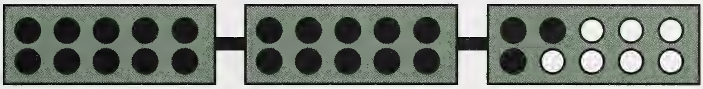
   ____

b. What does the **.6** tell? ____

____

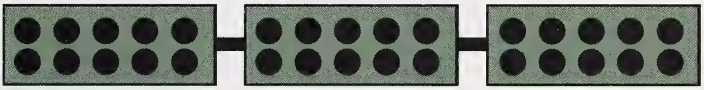
Check your answers in the Appendix.

You can draw box diagrams to show roller coaster trains of different lengths. For example, if the train has 2 full cars and 3 more riders are in the third car, you would draw this.



2.3 cars are full.

A roller coaster train that has 3 full cars with no empty seats would be shown this way.



3.0 cars are full.

9. Draw the following roller coaster trains and describe them using a decimal number. Each roller coaster car holds 10 riders.

a. a two-car train: One car has no empty seats and the second car has 6 riders.

____________ cars are full.

b. a two-car train with 15 riders

___________ cars are full.

c. a four-car train with 34 riders

___________ cars are full.

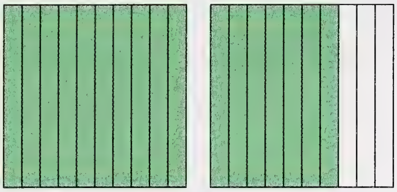
d. a one-car train with 8 riders

___________ cars are full.

Check your answers in the Appendix.

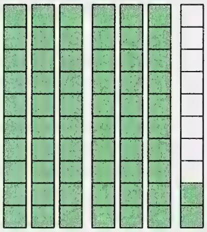
10. For each of the following, write a decimal number to show how much is shaded.

a.



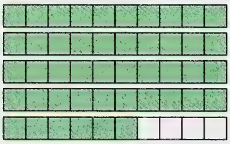
____

b.



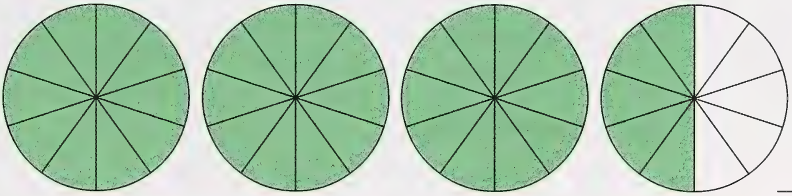
____

c.



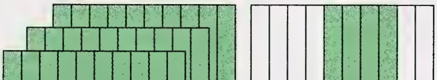
____

d.



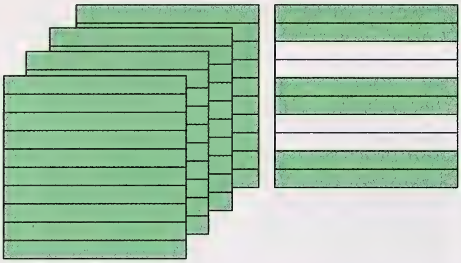
____

e.



____

f.



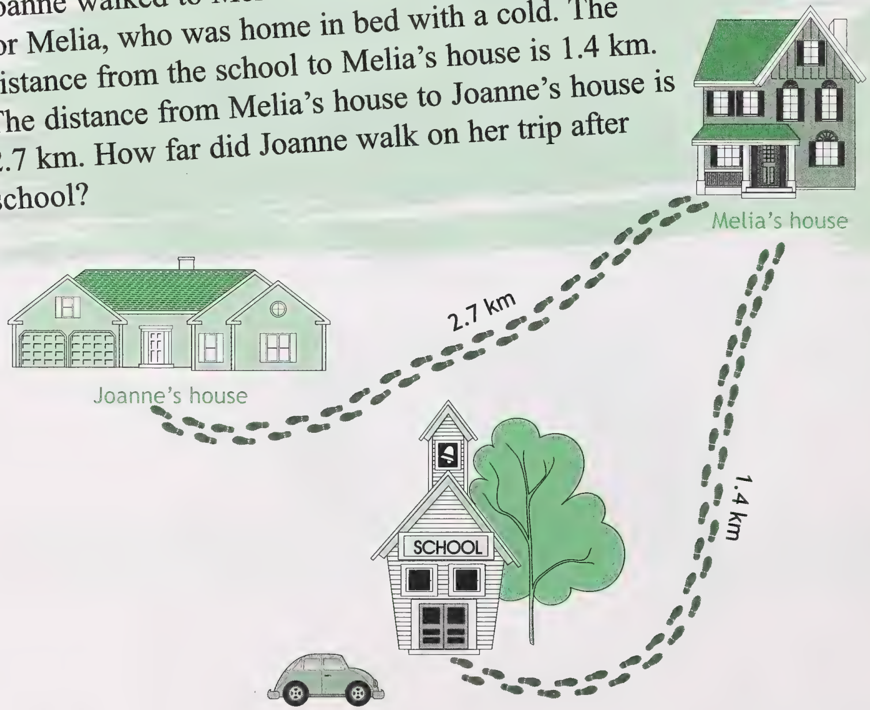
____

Check your answers in the Appendix.

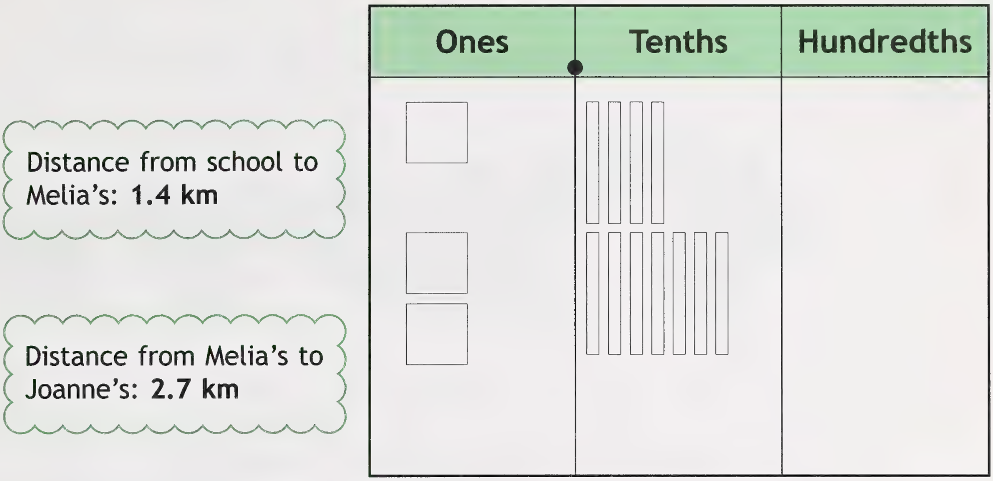
Adding Decimal Numbers

You can model the addition of decimals with tenths by using your base ten blocks or cutouts and the base ten decimal mat. Let each hundreds flat stand for **one** and each tens rod stand for **one tenth**.

Joanne walked to Melia's house after school to drop off homework for Melia, who was home in bed with a cold. The distance from the school to Melia's house is 1.4 km. The distance from Melia's house to Joanne's house is 2.7 km. How far did Joanne walk on her trip after school?



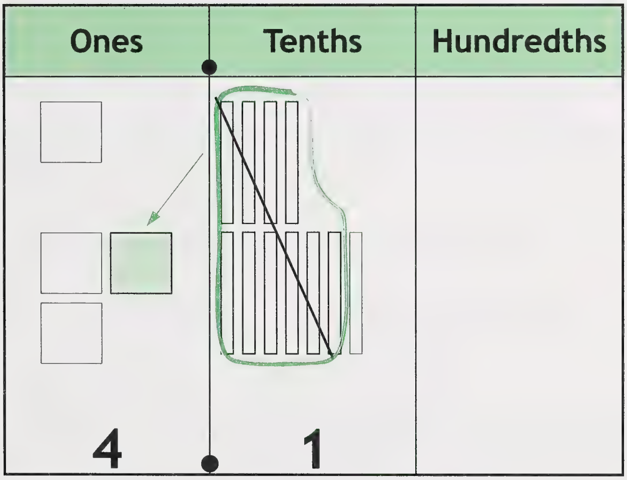
You can model your solution this way.


Ones
Tenths
Hundredths

Distance from school to Melia's: **1.4 km**

Distance from Melia's to Joanne's: **2.7 km**

To show the total number of kilometres Joanne walked, regroup 10 tenths to make 1 one.

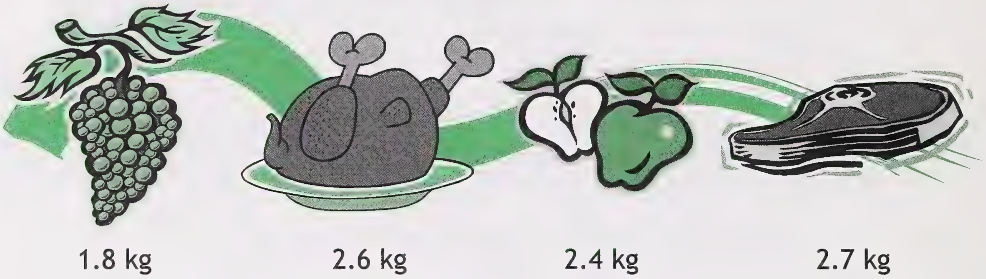

Ones
Tenths
Hundredths
4
1

$$\begin{array}{r} 1.4 \\ +\ 2.7 \\ \hline 4.1 \end{array}$$

Joanne walked a total of 4.1 km on her trip home.

Use base ten drawings or cutouts to model the solution to each of the following problems. If you use cutouts, you will have to glue them in place.

11. Fran went grocery shopping and bought the following items.



a. What is the mass of the grapes and apples?

b. What is the mass of the chicken and steak combined?

c. What is the total mass of all the groceries Fran purchased?

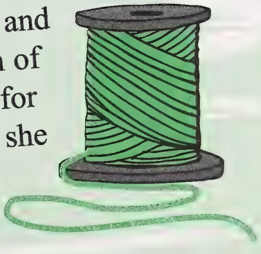
Check your answers in the Appendix.

Subtracting Decimal Numbers

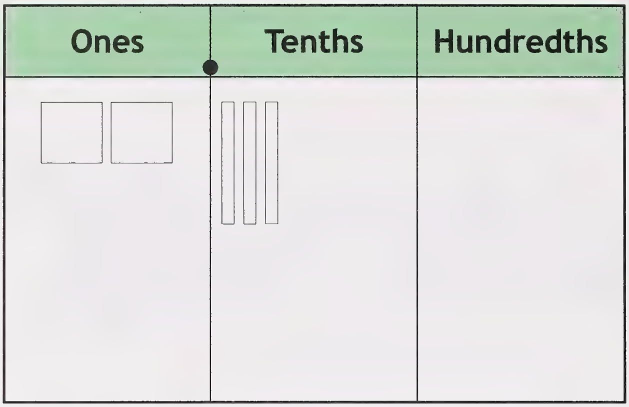
You can also show subtraction of decimals using base ten blocks, drawings, or cutouts. Let the hundreds flat stand for **one** and each tens rod stand for **one tenth**.

Use your base ten blocks and the decimal mat to model the following problem.

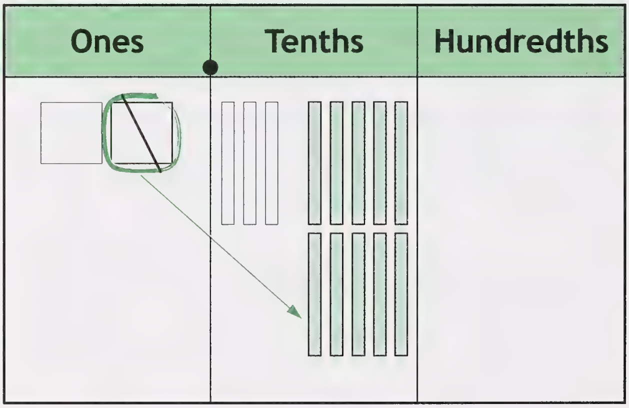
Gabriella wrapped two packages in brown paper and string so they could be mailed. She needed 2.3 m of string for the larger package and 1.8 m of string for the smaller package. How much more string did she use to wrap the larger package?



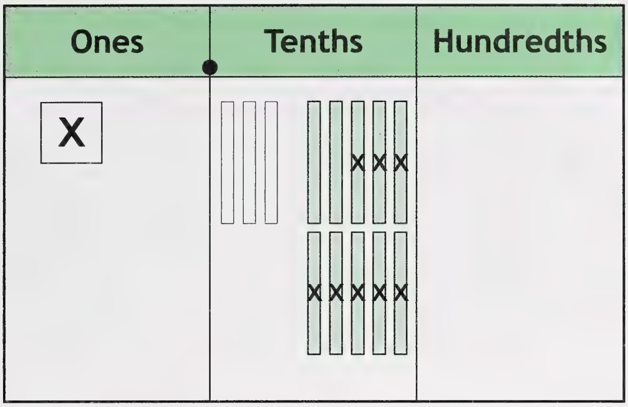
Begin by modelling the largest number first.


Ones
Tenths
Hundredths

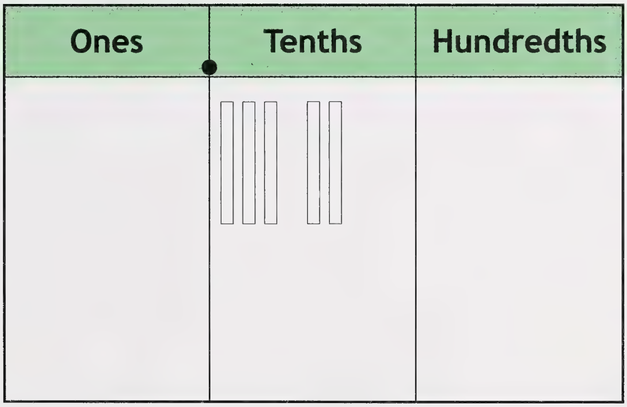
To subtract 1.8, begin by subtracting **.8**. Since there are only 3 tenths showing, you must trade a **one** for **10 tenths**. Remove one flat and place ten rods in the tenths column.


Ones
Tenths
Hundredths

Now you can subtract **8 tenths**. Show this by removing 8 rods. Finally, subtract the **one**. Show this by removing the remaining flat.


Ones
Tenths
Hundredths

Count the remaining blocks on the decimal mat.


Ones
Tenths
Hundredths

$$\begin{array}{r} \overset{1}{\cancel{2}}.3 \\ -\ 1.8 \\ \hline 0.5 \end{array}$$

Gabriella used 0.5 m more string when she wrapped the larger package.

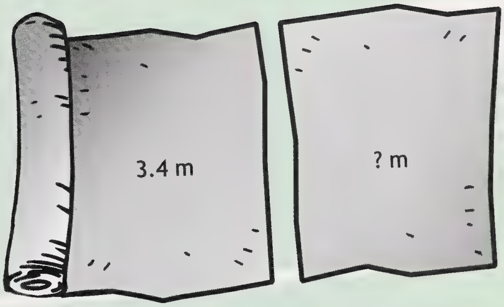
Use base ten drawings or cutouts to model the solution to each of the following problems. If you use cutouts, you will have to glue them in place.

12. Calvin went hiking one Saturday. He hiked 7.5 km in the morning and 3.8 km in the afternoon. How much further did he hike in the morning?

Check your answers in the Appendix.

13.

Donna had a roll of paper that was 5.2 m long. After she cut off a piece to make a banner, there were 3.4 m left on the roll. How long was the piece that she cut off?



Check your answers in the Appendix.

Basic Number Facts Practise

Ask your home instructor to time you as you complete the following exercises. Your goal is to complete all 25 questions in each exercise in 2 minutes. At the end of 2 minutes, count up how many questions you were able to complete. Write this number in the chart below. Then use the answer key in the Appendix to mark the exercise, and record your score in the space provided. Before you move on, go back and complete any questions you did not finish during the 2 minutes. Mark these questions using the answer key as well.

Basic Number Facts Practice

Addition Number Facts

Number Completed in 2 Minutes ______

Number Correct in 2 Minutes ______

Subtraction Number Facts

Number Completed in 2 Minutes ______

Number Correct in 2 Minutes ______

Record your score on the Number Facts Progress Chart.

14. Addition Number Facts

Timed Exercise: 2 minutes

$\begin{array}{r}8\\+\ 6\\\hline\end{array}$	$\begin{array}{r}4\\+\ 8\\\hline\end{array}$	$\begin{array}{r}6\\+\ 8\\\hline\end{array}$	$\begin{array}{r}4\\+\ 9\\\hline\end{array}$	$\begin{array}{r}9\\+\ 8\\\hline\end{array}$
$6+6=$	$8+9=$	$5+7=$	$5+8=$	$9+9=$
$\begin{array}{r}7\\+\ 7\\\hline\end{array}$	$\begin{array}{r}7\\+\ 6\\\hline\end{array}$	$\begin{array}{r}6\\+\ 9\\\hline\end{array}$	$\begin{array}{r}8\\+\ 7\\\hline\end{array}$	$\begin{array}{r}6\\+\ 7\\\hline\end{array}$
$8+5=$	$7+8=$	$9+7=$	$9+6=$	$5+6=$
$\begin{array}{r}9\\+\ 5\\\hline\end{array}$	$\begin{array}{r}8\\+\ 8\\\hline\end{array}$	$\begin{array}{r}7\\+\ 9\\\hline\end{array}$	$\begin{array}{r}5\\+\ 9\\\hline\end{array}$	$\begin{array}{r}9\\+\ 4\\\hline\end{array}$

Check your answers in the Appendix.

STOP

15. Subtraction Number Facts

Timed Exercise: 2 minutes

$\begin{array}{r} 13 \\ -\ 6 \\ \hline \end{array}$	$\begin{array}{r} 12 \\ -\ 7 \\ \hline \end{array}$	$\begin{array}{r} 16 \\ -\ 9 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ -\ 7 \\ \hline \end{array}$	$\begin{array}{r} 15 \\ -\ 9 \\ \hline \end{array}$
17 – 9 =	12 – 8 =	16 – 7 =	15 – 7 =	14 – 8 =
$\begin{array}{r} 15 \\ -\ 6 \\ \hline \end{array}$	$\begin{array}{r} 12 \\ -\ 9 \\ \hline \end{array}$	$\begin{array}{r} 13 \\ -\ 5 \\ \hline \end{array}$	$\begin{array}{r} 17 \\ -\ 8 \\ \hline \end{array}$	$\begin{array}{r} 13 \\ -\ 4 \\ \hline \end{array}$
15 – 8 =	13 – 8 =	14 – 6 =	16 – 8 =	14 – 9 =
$\begin{array}{r} 13 \\ -\ 9 \\ \hline \end{array}$	$\begin{array}{r} 18 \\ -\ 9 \\ \hline \end{array}$	$\begin{array}{r} 14 \\ -\ 5 \\ \hline \end{array}$	$\begin{array}{r} 12 \\ -\ 4 \\ \hline \end{array}$	$\begin{array}{r} 13 \\ -\ 7 \\ \hline \end{array}$

Check your answers in the Appendix.

Turn to Assignment Booklet 4B, and complete the activities for Day 10.

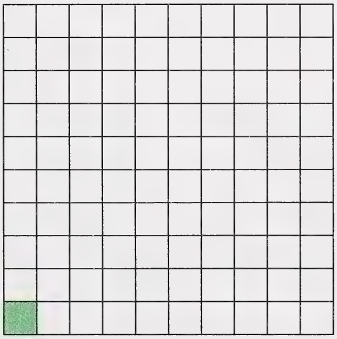
Adding and Subtracting Decimals (Hundredths)

Last day you reviewed adding and subtracting with tenths. Today you will look at adding and subtracting when the decimal numbers include hundredths.

Reviewing Decimal Place Value (Hundredths)

The square below is divided into 100 equal parts. Each part is **one hundredth** of the large square.

One hundredth can be written as $\frac{1}{100}$ or 0.01.



To write one hundredth as a decimal number, you can use the place-value chart.

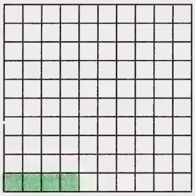
Tens	Ones	Tenths	Hundredths
	0 •	0	1

This zero shows that the number is less than 1.

This zero shows there are no tenths.

1. For each of the following, write the decimal number that represents the shaded part. Then write each decimal number in words.

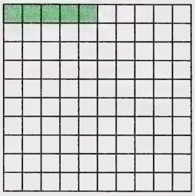
a.



Decimal number: ____________

Words: ____________________

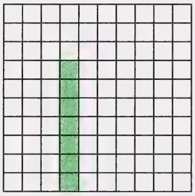
b.



Decimal number: ____________

Words: ____________________

c.



Decimal number: ____________

Words: ____________________

2. Write each of the following as a decimal number.

   a. two hundredths ______________

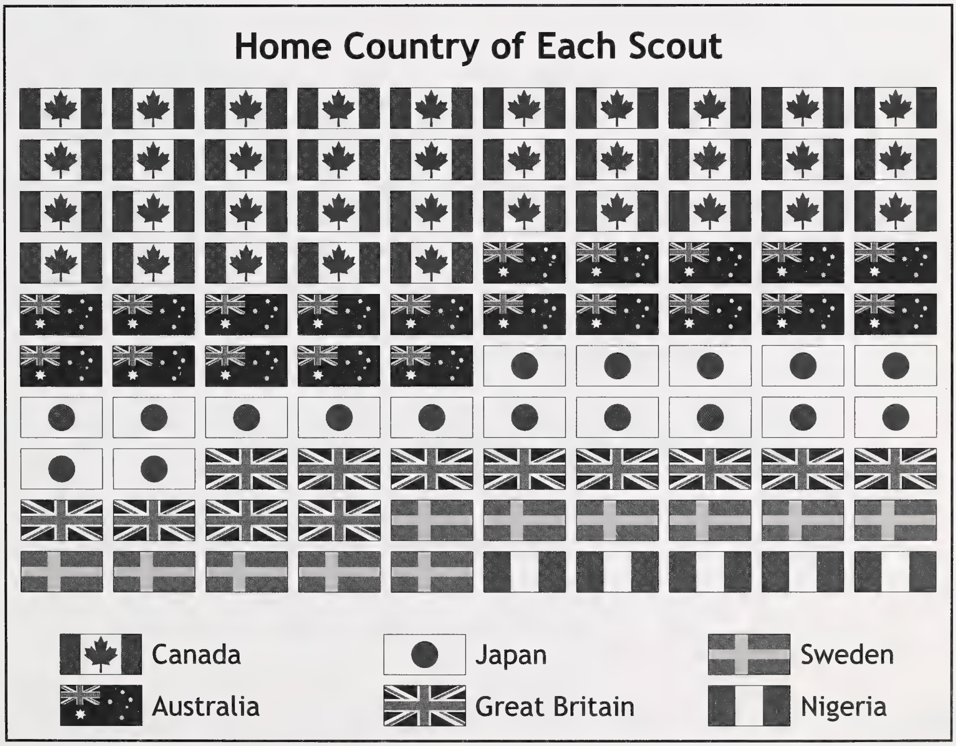
   b. six hundredths ______________

   c. eleven hundredths ______________

Check your answers in the Appendix.

Look at the box graph below. It is like the hundreds grid because it is also divided into 100 equal parts.

One hundred Boy Scouts from several countries are attending an International Jamboree. The box graph shows the number of Scouts from each country. Each flag stands for **one Scout**. What fraction of the Scouts come from each country?



By counting the number of flags, you can tell how many Scouts come from each country. Since there are 100 Scouts attending, each Scout is **one hundredth** of the total group.

You can use decimal fractions to show the fraction of Scouts from each country.

Example

Number of Scouts from Canada? **35**

Canadian flags cover **35 hundredths** $\left(\frac{35}{100}\right)$ of the box graph.

Decimal fraction: **0.35** of the Scouts are from Canada.

Use the information in the box graph to fill in the blanks.

3. **a.** __________ Scouts are from Australia.

b. Australian flags cover ____________________ of the graph.

c. Decimal fraction: __________ of the Scouts are from Australia.

4. **a.** __________ Scouts are from Japan.

b. Japanese flags cover ____________________ of the graph.

c. Decimal fraction: __________ of the Scouts are from Japan.

5. Write a **decimal fraction** in each blank.

a. __________ of the Scouts are from Great Britain.

b. __________ of the Scouts are from Sweden.

c. __________ of the Scouts are from Nigeria.

Check your answers in the Appendix.

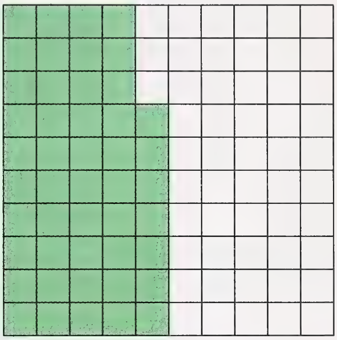
Ones, Tenths, and Hundredths

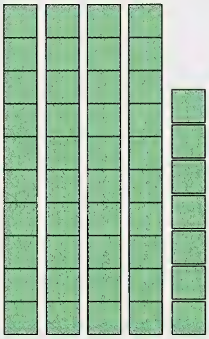
As you increase the number of hundredths that are shaded, you will see that the shaded part can be described in two ways:

- You can think of each 🟩 as 1 hundredth. There are 47 hundredths shaded in.

  Therefore, you would write the following:

  0.47 of the square is shaded.





- Since each column of ten is also equal to 1 tenth, you can count the tenths first and then count the remaining hundredths. In the large square, there are 4 tenths and 7 hundredths shaded in.

  Therefore, you would write:

  0.47 of the square is shaded.

The amount can be shown on a place-value chart.

Tens	Ones	Tenths	Hundredths
	0 •	4	7

This shows there are 4 tenths.

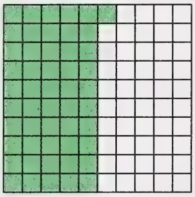
This shows there are 7 hundredths.

You can see that you can describe the shaded part in two ways.

4 tenths and 7 hundredths is equal to **47 hundredths**.

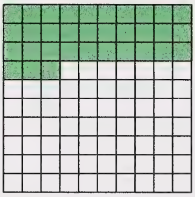
6. For each of the following questions, write a decimal number that describes the shaded part of the square.

a.



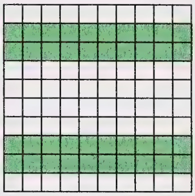
____

b.



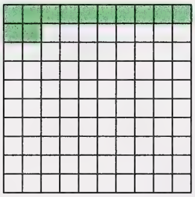
____

c.



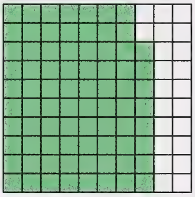
____

d.



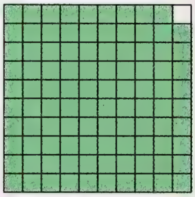
____

e.



____

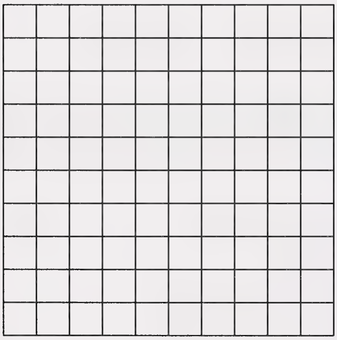
f.



____

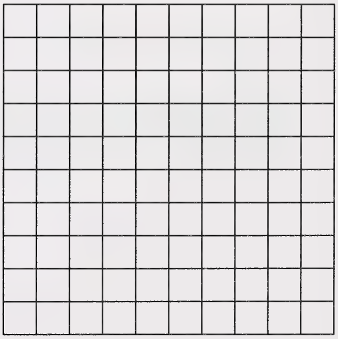
7. Use a felt marker or coloured crayon to shade in the amounts shown for each square.

a.



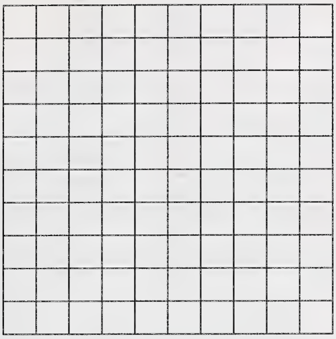
0.62

b.



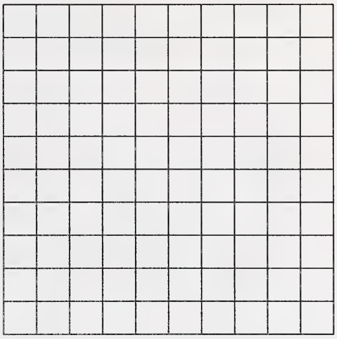
0.27

c.



0.04

d.



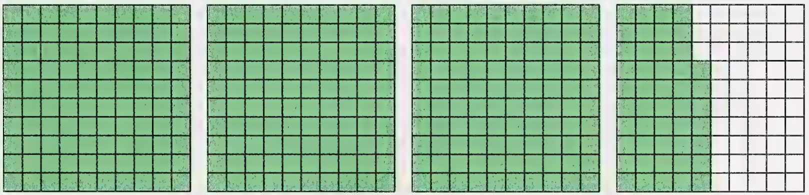
0.40

Check your answers in the Appendix.

If you shade in all of the parts until the larger square is completely shaded, you will have 100 shaded parts or 100 hundredths. When all of the hundredths are shaded, 1 or 1.00 is written to show that one whole square is shaded.

Example

Write a decimal number to show how much is shaded.



Count the number of whole squares (ones).

Count the number of shaded tenths.

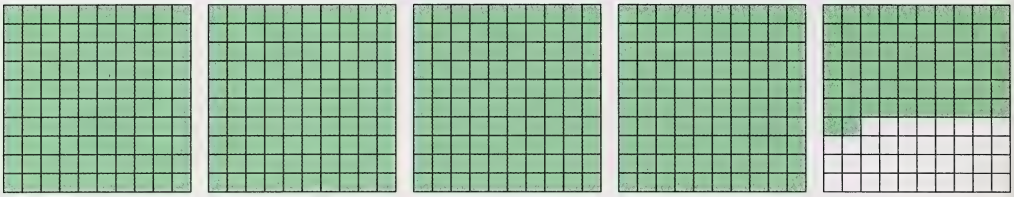
Count the number of shaded hundredths.

Ones	Tenths	Hundredths
3 •	4	7

Write 3.47 to show that 3.47 large squares are shaded.

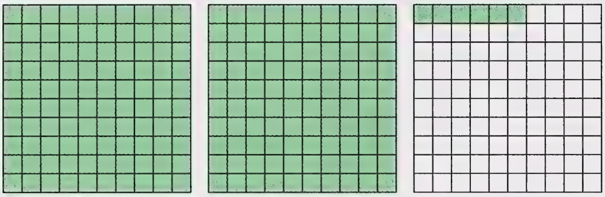
8. For each of the following questions, write a decimal number that describes how much is shaded.

a.



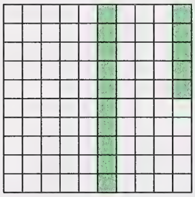
____

b.



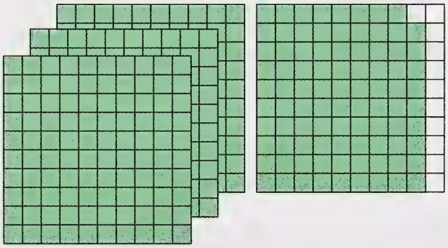
____

c.



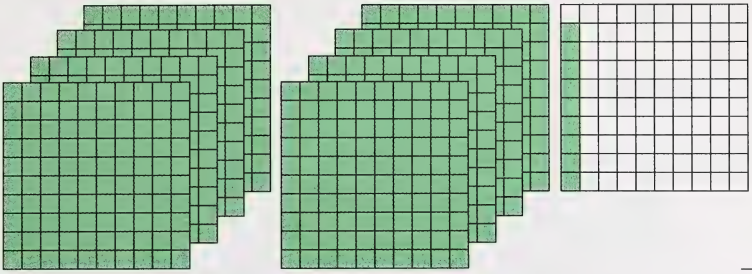
____

d.



____

e.



____

Check your answers in the Appendix.

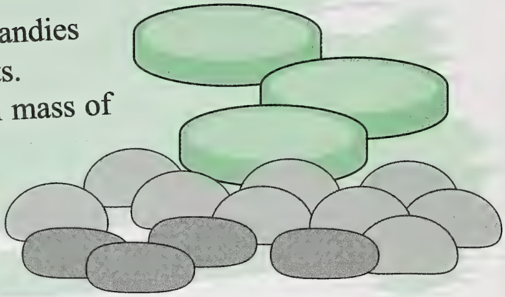
Finding Decimal Sums

You can show what happens when you add with hundredths by using base ten blocks or cutouts. For the next example, you will need to follow along with base ten blocks or the cutouts in Day 11 of the Cut-Out Learning Aids section of the Appendix.

Use the base ten decimal mat from Day 10.

Example

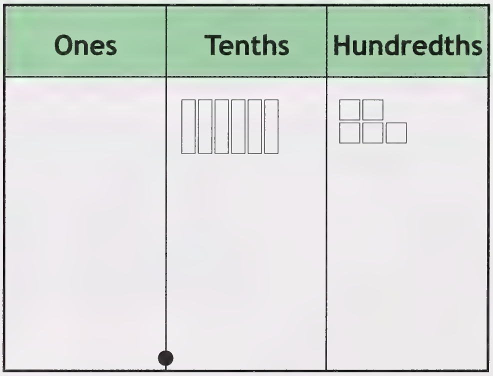
Tina bought 0.65 kg of jelly candies and 2.87 kg of chocolate mints. Altogether, what was the total mass of the candy that she bought?



$$0.65 + 2.87 =$$

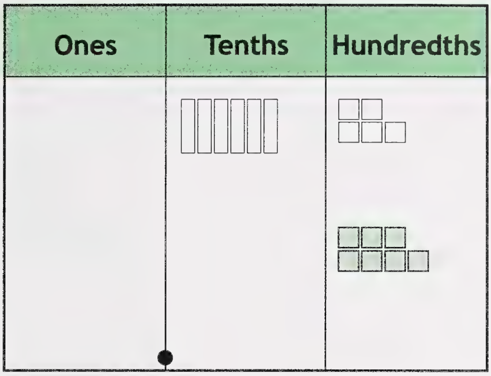
Begin by showing 0.65 on the base ten decimal mat.

- Place 6 tenths in the Tenths column and 5 hundredths in the Hundredths column.



To add 2.87, first add on the hundredths.

- On the mat, place 7 more hundredths in the Hundredths column.

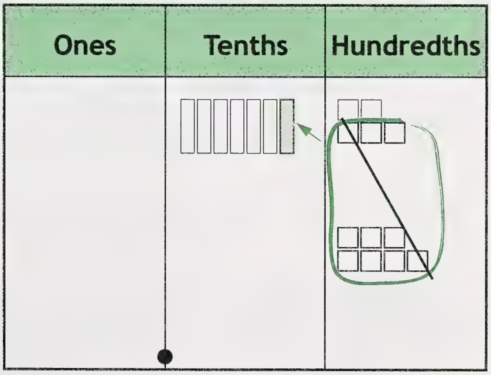

Ones
Tenths
Hundredths

- Count up the hundredths.

5 + 7 = 12 hundredths

Since you have more than 10 hundredths, regroup by trading 10 hundredths for 1 tenth.

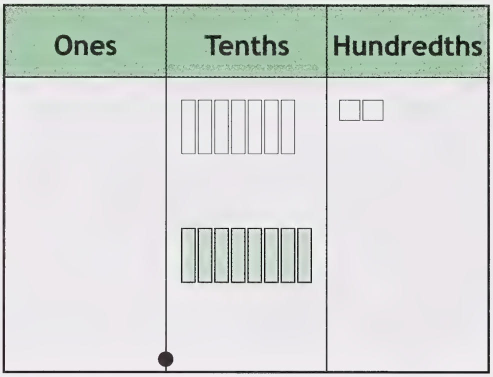
- Remove the 10 hundredths and place another tenth in the Tenths column.


Ones
Tenths
Hundredths

This leaves 2 hundredths in the Hundredths column.

Next, add on the 8 tenths from 2.87.

- On the mat, place 8 more tenths in the Tenths column.

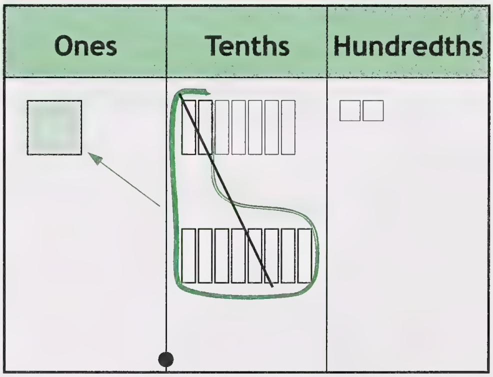

Ones
Tenths
Hundredths

- Count up the tenths.

$$6+1+8=15 \text{ tenths}$$

You know that 10 tenths equals 1, so you will regroup by trading 10 tenths for a one.

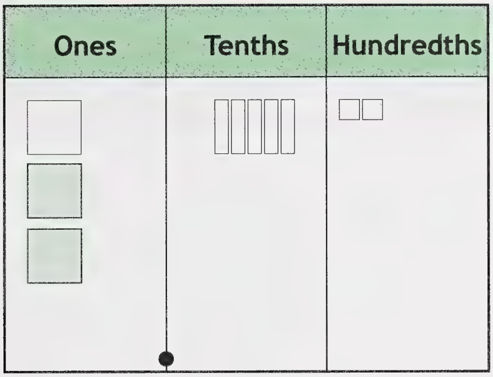
- Remove 10 tenths and place a one in the Ones column.


Ones
Tenths
Hundredths

This leaves 5 tenths in the Tenths column.

Finally, add on the 2 ones from 2.87.

- On the mat, place 2 more ones in the Ones column.



- Count up the ones.

$1 + 2 = 3$ ones

$$\begin{array}{r} {}^{1}\,\,{}^{1} \\ 0.65 \\ +\ 2.87 \\ \hline 3.52 \end{array}$$

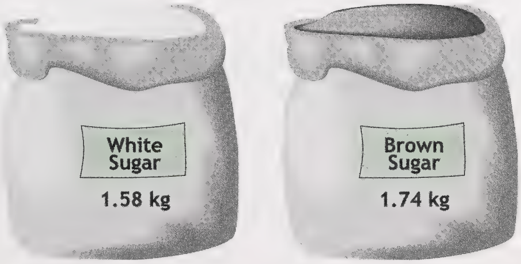
Since there are fewer than 10 ones, there is no need to regroup them.

The sum of $0.65 + 2.87$ is 3.52.

Sentence answer: Tina bought a total of 3.52 kg of candy.

Use base ten drawings or cutouts to show how you would do the addition and regrouping when finding the answer to the following problem. If you use cutouts, you should glue them in place.

9. Trudy bought two kinds of sugar from the bulk bins at the grocery store.



What was the total mass of the white sugar and the brown sugar?

$1.58 + 1.74 =$

Ones	Tenths	Hundredths

Sentence answer: ______________________________

Check your answer in the Appendix.

Finding Decimal Differences

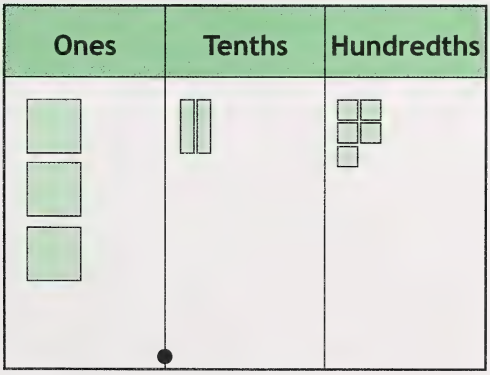
You can also show what happens when you subtract with hundredths by using base ten blocks or cutouts. For this exercise, you will again need your base ten blocks or cutouts and the base ten decimal mat.

Derek bought a 3.25-kg bag of coffee beans. He took the bag home and ground some of the beans with a coffee grinder. When he weighed the leftover beans, he found he had 1.68 kg of beans left in the bag. What was the mass of the beans that he ground?

$$3.25 - 1.68 =$$

Begin by showing 3.25 on the decimal mat.

- To do this, place 3 ones, 2 tenths, and 5 hundredths in the correct columns.

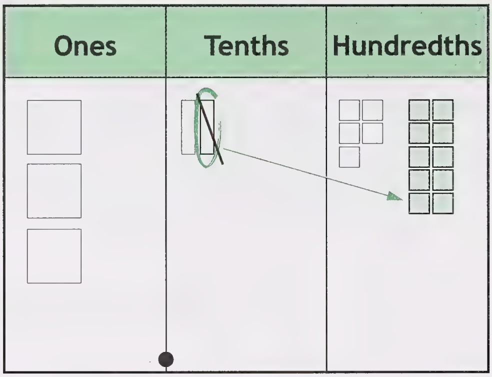


To subtract 1.68, first subtract the 8 hundredths.

> Can you take away 8 hundredths from the mat if there are only 5 hundredths there?

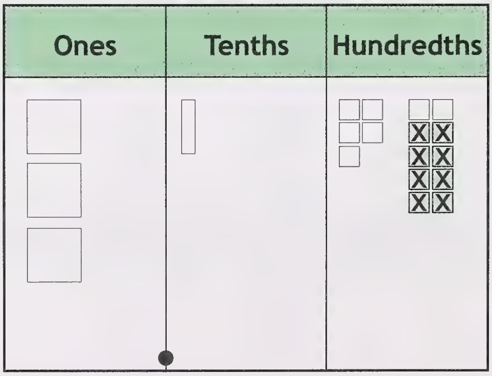
You can do this only if you regroup the tenths by changing 1 of the tenths to hundredths.

- Remove 1 tenth from your mat and exchange it for 10 hundredths.
- Place the 10 hundredths in the Hundredths column with the other 5 hundredths.



Now you can subtract the 8 hundredths.

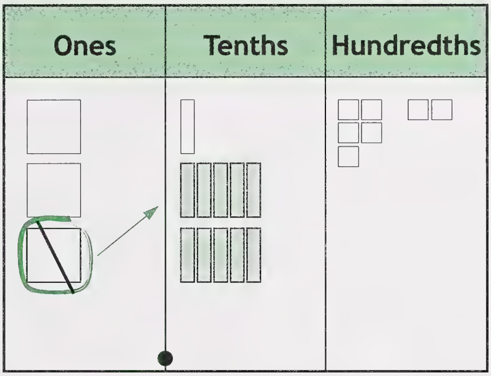
- Remove 8 hundredths from the Hundredths column on your mat.



This leaves 7 hundredths.

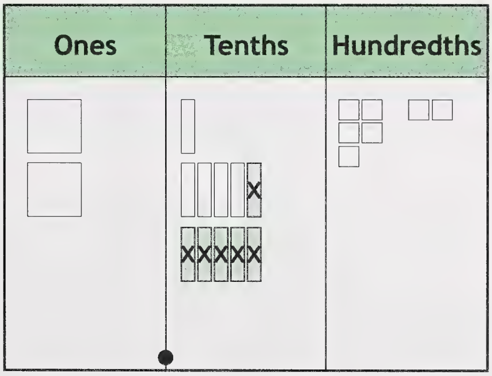
Next, subtract the tenths. Six tenths are being subtracted from 1 tenth. You can do this only if you regroup the ones, changing 1 of the ones to tenths.

- Remove 1 one from the mat and trade it for 10 tenths.
- Place the 10 tenths in the Tenths column with the 1 tenth that is already there.


Ones
Tenths
Hundredths

Now you can subtract the 6 tenths.

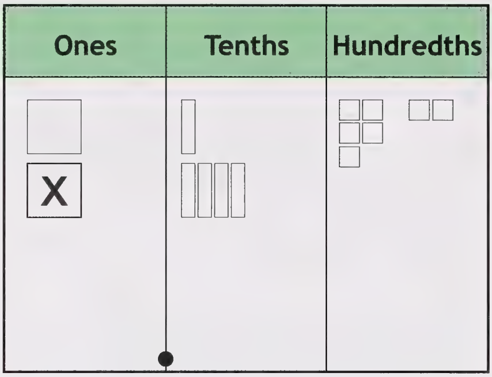
- Remove 6 tenths from the Tenths column on your mat.


Ones
Tenths
Hundredths

This leaves 5 tenths.

Finally, subtract the ones. There are 2 ones remaining. You need to subtract 1 one.

- Remove 1 one from the Ones column.



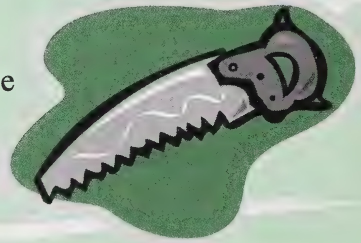
This leaves 1 one.

The difference is 1.57.

Sentence answer: Derek ground 1.57 kg of coffee beans.

10. Use base ten drawings or cutouts to show how you would do the subtraction and regrouping when finding the difference in the following problem. If you use cutouts, you will need to glue them in place.

A carpenter is building a shelf in a house. The board he is starting with is 2.43 m long. The shelf needs to be 1.79 m long. How long will the leftover piece of board be?



$2.43 - 1.79 = \boxed{}$

Ones ☐	Tenths ▯	Hundredths ▫

Sentence answer: ______________________________

Check your answers in the Appendix.

Turn to Assignment Booklet 4B, and complete the activities for Day 11.

Day 12

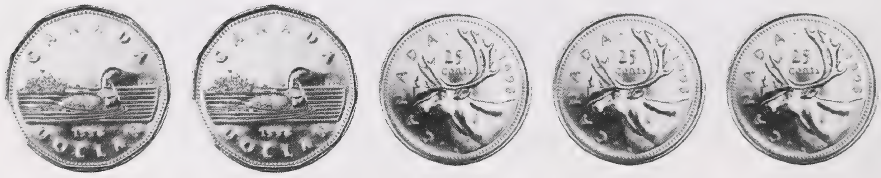
Working with Money Amounts

Writing Money Amounts

Do decimal numbers written with hundredths look familiar to you? You see numbers with two decimal places when you are counting or spending money. The number 2.75 takes on a different meaning when a dollar sign ($) is written in front of it.

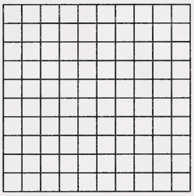
$2.75

This number is read, "Two dollars and seventy-five cents."



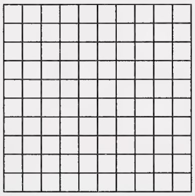
1. **a.** How many cents (pennies) are in a dollar? __________

   b. The large square below stands for one dollar. How many small squares are there? __________



   c. Each small square stands for one __________.

   d. Shade in the amount that stands for 8¢.

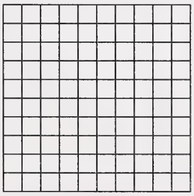


   e. You can also say that 8¢ is __________ hundredths of a dollar.

   f. One dime is the same as __________ cents.

   g. How many hundredths of a dollar is one dime? __________

   h. If the square below stands for one dollar, shade in the amount that stands for 75¢.



Check your answers in the Appendix.

There are two ways to write money amounts. One way is to put a cent sign (¢) after the number. The cent sign is usually used for money amounts of less than one dollar.

4¢ 10¢ 25¢ 99¢

You can also use a dollar sign ($) and a decimal to write money amounts. Since cents are always expressed as hundredths, two decimal places are always used.

$0.33 $1.50 $6.04 $100.00

2. Write these money amounts in two ways (with a cent sign and then with a dollar sign and a decimal).

a. seventeen cents ____________________

b. five cents ____________________

c. eighty-nine cents ____________________

3. Write these money amounts using a dollar sign and a decimal.

a. one dollar and sixty-three cents ____________________

b. three dollars and nine cents ____________________

c. sixty-seven dollars and seventy-six cents ____________________

4. Use words to write each of these amounts.

a. $0.77 ____________________

b. $12.38 ____________________

c. $20.08 ____________________

Check your answers in the Appendix.

Adding and Subtracting Money Using Mental Math

You probably already know something about adding and subtracting money. In fact, you probably do a lot of mental math in your head using money amounts.

5. If you were selling hockey cards for 25¢ each at a garage sale, and someone bought 3 cards, how much would you charge that person?

____

Check your answer in the Appendix.

Now think about how you got your answer. Did you use one of these methods?

- add 25¢ + 25¢ + 25¢
- multiply 3¢ × 25¢
- think, "Four quarters is $1.00, so three quarters is $1.00 – $0.25."

Each of these methods is a mental math strategy. You probably know other strategies for calculating money amounts in your head. Use a mental math strategy to solve the following problem.

6. If you charge $2.50 an hour for baby-sitting, and you baby-sat for 3 hours, how much should you be paid?

____

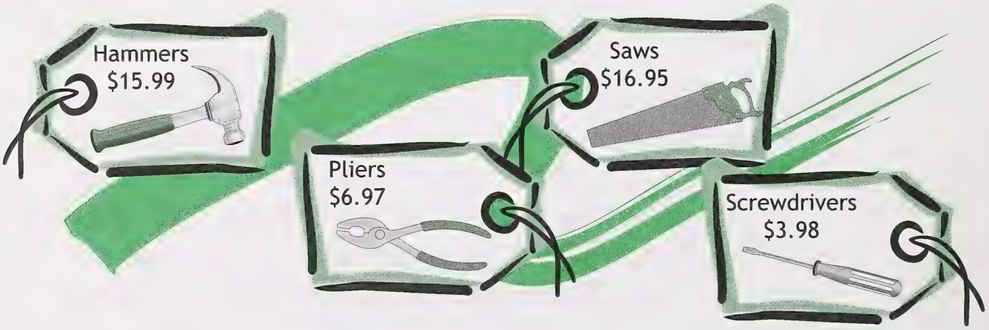
Check your answers in the Appendix.

How did you get your answer? Did you use one of these methods?

- add $\$2.50+\$2.50+\$2.50$
- multiply $3\times\$2.50$
- think, "If $25+25+25$ is 75, then $\$2.50+\$2.50+\$2.50$ is \$7.50."

Perhaps you used another method of your own. Whichever way you calculated the answer, you likely found that you were adding, subtracting, or multiplying in your head.

Tiger went to the hardware store during the Spring Tool Sale. The following tools were on sale:



In order to calculate the cost of a hammer and a screwdriver, Tiger uses mental math to calculate in his head.

A hammer costs:	$15.99	This is 1¢ less than $16.00
A screwdriver costs:	$3.98	This is 2¢ less than $4.00
The total cost is:		3¢ less than $20.00
Therefore, the total cost is:		$19.97

7. Use mental math to find the total cost for each of the following purchases.

   a. a saw and a pair of pliers

   b. a saw and a screwdriver

   c. two pairs of pliers

Check your answers in the Appendix.

Counting Change

Lucie paid for a loaf of bread with a 5-dollar bill. If the bread cost $1.29, how much change should she get back?

I'll count on from $1.29.

$1.29 to $1.30 is 1¢.

$1.30 to $1.50 is 20¢.

$1.50 to $2.00 is 50¢.

$2.00 to $5.00 is $3.00.

The total amount of change is $3.71.

Use the play money found in Day 12 of the Cut-Out Learning Aids section of the Appendix to answer question 8.

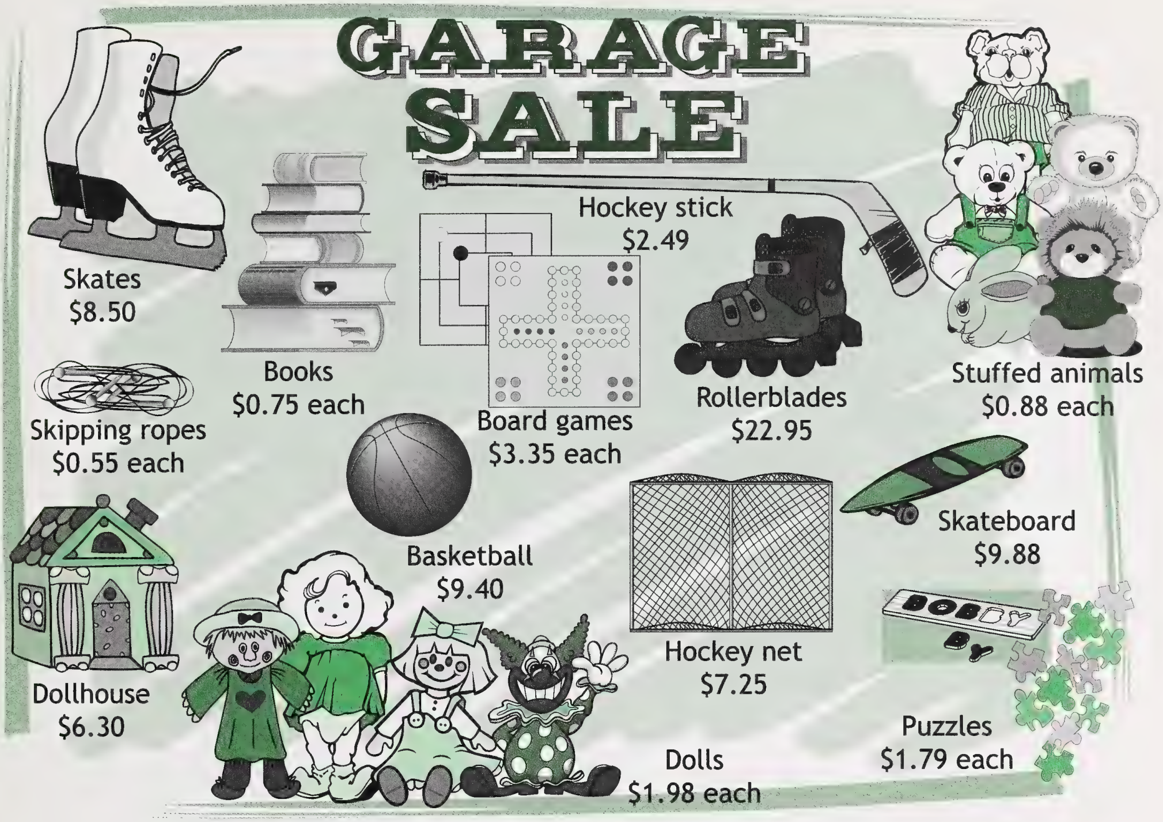
8. Zack and Zelda decided to hold a garage sale one Saturday to sell some of the toys and sports equipment they no longer used. All of the items were priced and displayed on tables.

Look at the picture on the next page and use the information to answer the questions.

a. Trina decided to buy Zelda's old dollhouse. She paid Zelda with a 10-dollar bill. Use the play money to count out how much change she should get back.

Write the amount here. Draw the change here.

____


GARAGE SALE
Skates $8.50
Books $0.75 each
Hockey stick $2.49
Stuffed animals $0.88 each
Skipping ropes $0.55 each
Board games $3.35 each
Rollerblades $22.95
Skateboard $9.88
Basketball $9.40
Dollhouse $6.30
Hockey net $7.25
Puzzles $1.79 each
Dolls $1.98 each

b. Santos bought the rollerblades. He paid for them using a 20-dollar bill and a 10-dollar bill. Use play money to count out how much change he got back.

Write the amount here. Draw the change here.

____

c. Jeet bought one item. He paid with a 10-dollar bill and got back $7.51. What item did he buy? ______________________________

d. You have $5.00.

- What is the most expensive item you can afford to buy?

  ____

- How much change will you get back? ______________________

- Name one other item you could buy with the money you have leftover. ______________________

e. Carl bought a puzzle for his younger sister. He paid for the puzzle with a 10-dollar bill. Zack gave Carl only coins for change. Draw the fewest number of coins that Carl could have received.

Check your answers in the Appendix.

Estimating Money Sums and Differences

9.

Zack and Zelda recorded the sales from their garage sale for two days.

Saturday $98.89
Sunday $47.49

Explain how you would **estimate** the total amount of sales for the two days.

Check your answers in the Appendix.

There are several ways to estimate $\$98.89+\$47.49$.

- You could round each amount to the nearest $10.

$$\begin{array}{rr} \$98.89 \rightarrow & \$100.00 \\ \$47.49 \rightarrow & \underline{\$\ \ 50.00} \\ & \$150.00 \end{array}$$

$\$98.89+\$47.49$ is about $150.00.

- You could round one of the numbers to the nearest $10, and then add this number to the other number by counting by tens.

  $47.49 is little less than $50.00.

  Add $50 to $98.89 (count 98, 108, 118, 128, 138, 148) and then add on the cents: $148.89.

  $98.89 + $47.49 is a little less than $148.89.

- You could add the tens and then estimate.

  $90 + $40 = $130
  $8.89 + $7.49 is more than $10.
  $130 + $10 = $140

  $98.89 + $47.49 is more than $140.00.

- You could round to the nearest $5.

  $98.89 is about $100.00.
  $47.49 is about $45.00.

  $98.89 + $47.49 is about $145.00.

Did you find that your own way of estimating was similar to one of these methods? Perhaps you found another way to estimate that is different from those shown.

10. Look at the following two questions. Use **two** different ways to estimate the answer for each question.

Add	**Subtract**
a. \$27.98 + \$58.55	**b.** \$296.24 – \$47.89
Method 1	**Method 1**
Method 2	**Method 2**

Check your answers in the Appendix.

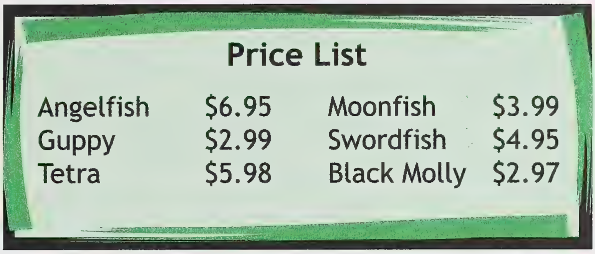
Solving Money Problems

Solve each of the following problems. Show your method of calculation. You may use base ten blocks, drawings, cutouts, or play money if you wish. Be sure to include a word answer.

11.

Lorna had $9.00. She spent $6.95 for an angelfish for her aquarium. How much money did she have left?

12. The pet store where Lorna bought her fish had the following sign posted.



Price List

Angelfish	$6.95	Moonfish	$3.99
Guppy	$2.99	Swordfish	$4.95
Tetra	$5.98	Black Molly	$2.97

a. How much would it cost to buy a tetra and a black molly?

b. How much would two guppies and a moonfish cost?

c. How much more does an angelfish cost than a black molly?

13. At the supermarket, Danielle bought a pineapple for her mother. The price of the pineapple was $6.52. What is the least number of coins she could have got back in change if she paid with a 10-dollar bill? Draw the coins.

Check your answers in the Appendix.

Taking Another Look

The following activities are optional. You may choose to do them or not. You **should** complete the activities if you are still having difficulty with addition or subtraction, or if you simply wish to improve your speed and accuracy in these two operations.

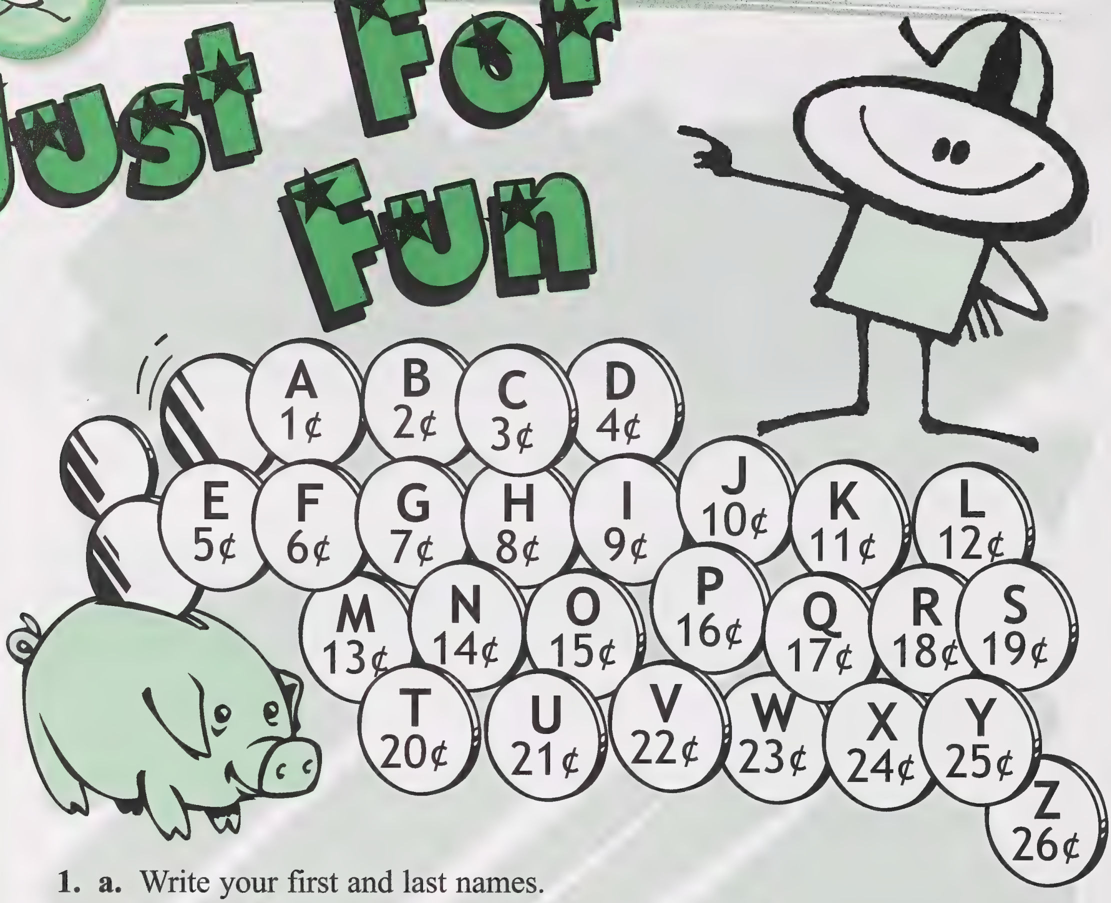
If you choose **not** to do the activities at this time, you may wish to return here later to review addition and subtraction before completing the review activities for Day 14.

Estimate each sum or difference. Use a check mark (✓) to show your estimate.

		Less than $10	**Between $10 and $20**	**More than $20**
1.	$7.43 + $2.85			
2.	$12.04 – $1.95			
3.	$11.78 + $9.78			
4.	$13.91 – $3.99			
5.	$15.25 – $5.94			
6.	$4.06 + $6.14			
7.	$23.02 – $1.96			
8.	$4.45 + $4.54			
9.	$9.85 + $10.55			
10.	$13.44 – $3.62			

Check your answers in the Appendix.

Just For Fun


A 1¢
B 2¢
C 3¢
D 4¢
E 5¢
F 6¢
G 7¢
H 8¢
I 9¢
J 10¢
K 11¢
L 12¢
M 13¢
N 14¢
O 15¢
P 16¢
Q 17¢
R 18¢
S 19¢
T 20¢
U 21¢
V 22¢
W 23¢
X 24¢
Y 25¢
Z 26¢

1. a. Write your first and last names.

________________________ ________________________

b. How much is your name worth? ____________

2. Find the value of the names of the other members of your family. Who has the most "valuable" name? ____________________

Turn to Assignment Booklet 4B, and complete the activities for Day 12.

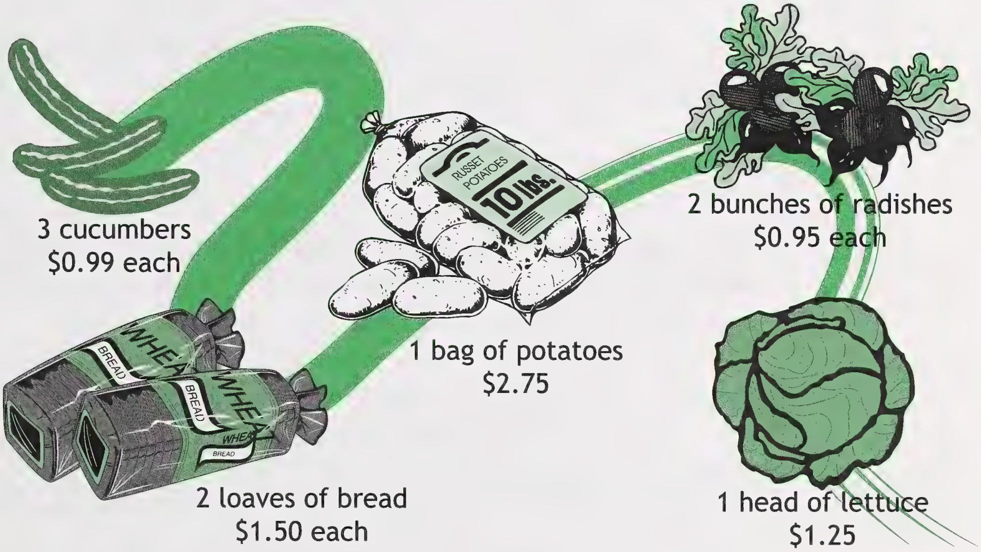
Choosing a Calculation Method

Whenever you are faced with the task of solving a problem that involves numbers, you will usually have to do an arithmetic calculation to find the answer.

Perhaps you have already discovered that not everyone uses the same calculation method to solve a problem. There are several ways to arrive at an answer even when the task is adding two numbers together.

Example

Ann Marie went shopping for groceries on Saturday morning. She wanted to buy many things, but had only $10 in her wallet. She chose the following items.


3 cucumbers
$0.99 each
RUSSET POTATOES
10 lbs.
1 bag of potatoes
$2.75
2 bunches of radishes
$0.95 each
WHEAT
BREAD
2 loaves of bread
$1.50 each
1 head of lettuce
$1.25

Ann Marie wonders if $10 will be enough to pay for all these groceries.

1. Explain what Ann Marie would have to do to find out if she has enough money. Tell what operations she would use.

Check your answers in the Appendix.

You probably said that Ann Marie must first use the addition operation. This is correct. However, she can do the addition in a variety of ways:

- She could take out a pencil and paper, write down the amounts in a column, and add the numbers.
- She could add all the numbers with a calculator.
- If she had some manipulatives (such as play money or base ten blocks), she could lay out the correct amount for each item purchased and then count all the money (or blocks).
- She could try using the mental math strategies she has been learning. (For example, 3 times $0.99 is 3 times $1.00 less $0.03, which equals $2.97.)
- She could try estimating the total cost by rounding the numbers and adding them in her head.

$$\$3 + \$3 + \$2 + \$3 + \$1$$

All five of these methods would work to determine if Ann Marie has enough money. In certain situations, however, some methods are better than others.

2. Which one of the five calculation methods would **you** have used? Tell why you would choose that particular method.

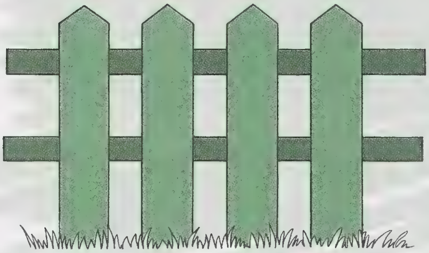
3. Use your calculation method to find the total or approximate cost of the items Ann Marie has placed in her shopping basket. Does she have enough money?

Check your answers in the Appendix.

Different Calculation Methods

You use adding and subtracting regularly in your everyday life. However, you do the calculation differently depending on the situation you are in.

Sometimes you estimate because you are looking for an approximate answer.

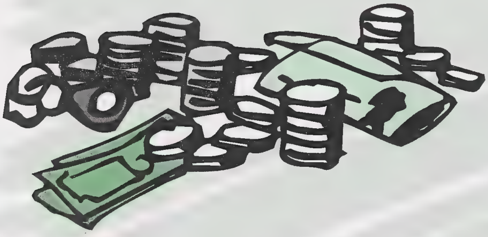


"How much time did it take you to paint the fence?"

9:00 A.M. – 11:45 A.M
12:20 P.M. – 4.25 P.M.

Answer: About 7 hours

Sometimes you need an exact answer, so you might use paper and pencil or a calculator.



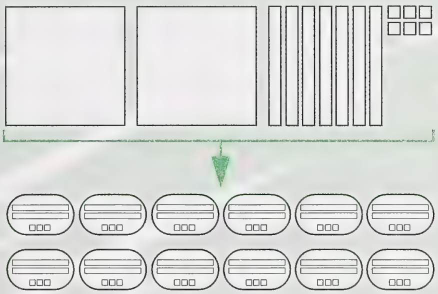
"Count the money and deposit it in your bank account."

10-dollar bills ...	$180.00
5-dollar bills	$50.00
2-dollar coins	$16.00
1-dollar coins	$21.00
Answer:	**$267.00**

Sometimes, if you are facing a difficult problem, it is helpful to use manipulatives such as base ten blocks, counters, or play money.

"There are 276 cows in 12 pens. How many cows are in each pen?"

Divide 276 base ten blocks into 12 equal groups.



Answer: 23 cows

Sometimes you use mental math strategies to make the calculation easier to do in your head.

"If there are 24 hours in 1 day, how many hours are in 8 days?"

Think:

- 24 is almost 25.
- To find 8 × 25, think of 8 quarters:
  8 × $0.25 = $2.00
  8 × 25 = 200
- 8 × 24 will be less than 8 × 25.
- Subtract 8 from 200.

Answer: 192 hours

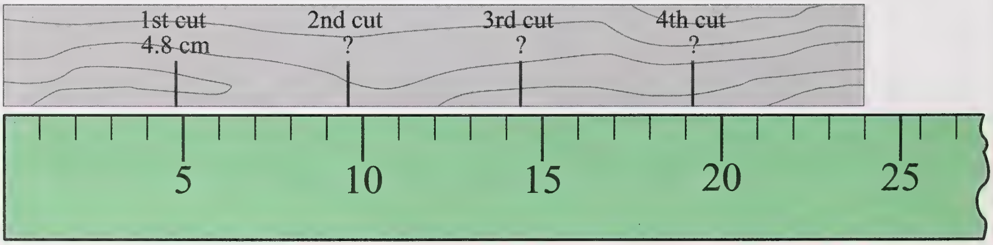
As you can see, different situations call for different calculation methods. It's true that one method of calculation might work for many different kinds of problems, but it's important to choose the best method for the situation. Therefore, you need to practise all of the methods: **paper and pencil, calculator, estimation, manipulatives, and mental math strategies**.

If you are familiar with all of these methods of calculation, you will be able to choose the one that works best and explain why it is the best method for the situation.

4. Look at each of the following situations. Tell what method of calculation you would use to solve the problem (**paper and pencil**, **calculator**, **estimation**, **mental math**, or **manipulatives**). Then explain why you think this is the best method to use. Remember, you don't have to solve these problems. You just need to decide **what** method you would use to calculate the answer.

   a.

Suppose you were putting together a model of a sailboat. A piece of wood in the kit must be cut into five equal pieces that are each 4.8 cm long. If you lay your ruler alongside the wood, you can easily mark 4.8 cm for the first cut. Without moving the ruler or the wood, how will you decide where to make the second, third, and fourth cuts?



What method of calculation would you use to solve this problem? ______________________

Explain why you chose this method. ______________________

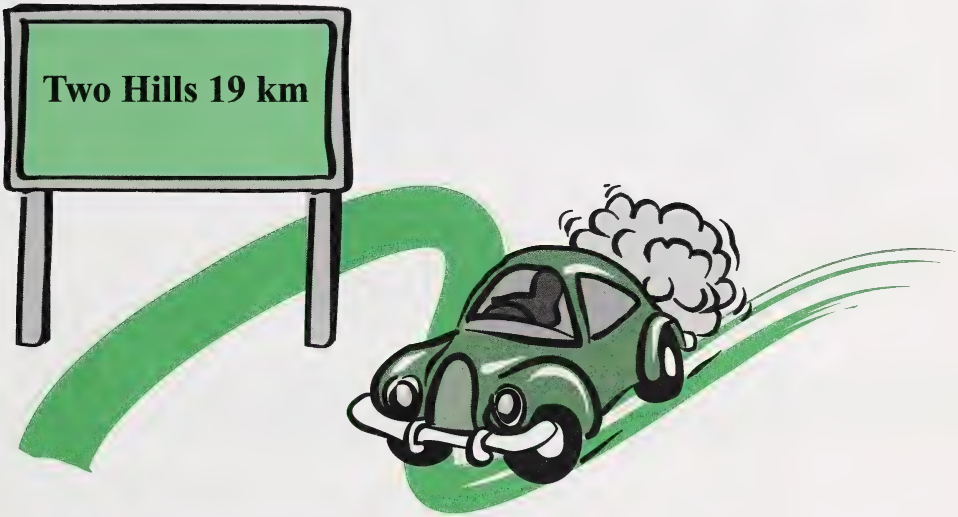
____

____

____

____

b. Alex and his family were driving to visit friends in Two Hills. After they had driven 68 km, they saw a sign that said "Two Hills 19 km." How far is Two Hills from home? How far will they have travelled by the time they get home?



What method of calculation would you use to solve this problem? ______________________

Explain why you chose this method. ____________________

____

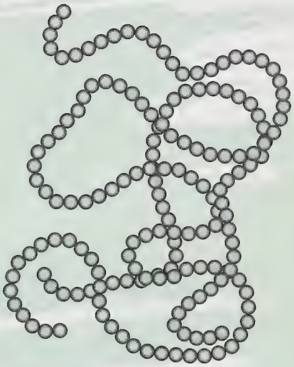
____

____

____

c.

Sarah and Beth are in charge of buying beads for the Craft Club. Their club project is to make necklaces for the Spring Craft Fair. Each necklace requires 195 beads. If there are 1000 beads in a package, how many packages are needed to make 20 necklaces?



What method of calculation would you use to solve this problem? ____________________

Explain why you chose this method. ____________________

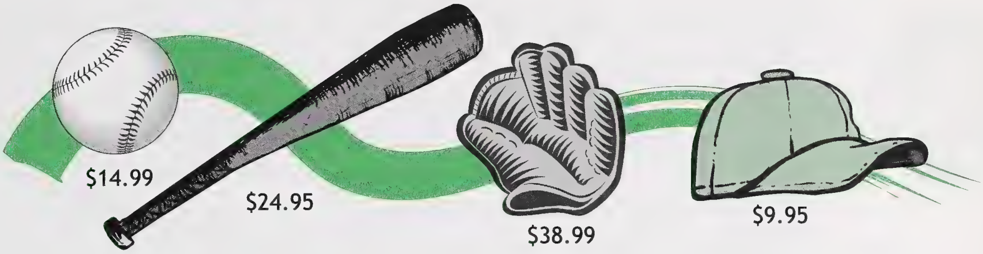
____

____

____

____

d. Maurice needs to buy some new baseball equipment. A flyer advertising a sale on sporting goods at a nearby store shows the following items.



If Maurice wants to buy one of each of the items, about how much money will he need?

What method of calculation would you use to solve this problem? ____________________

Explain why you chose this method. ____________________

____

____

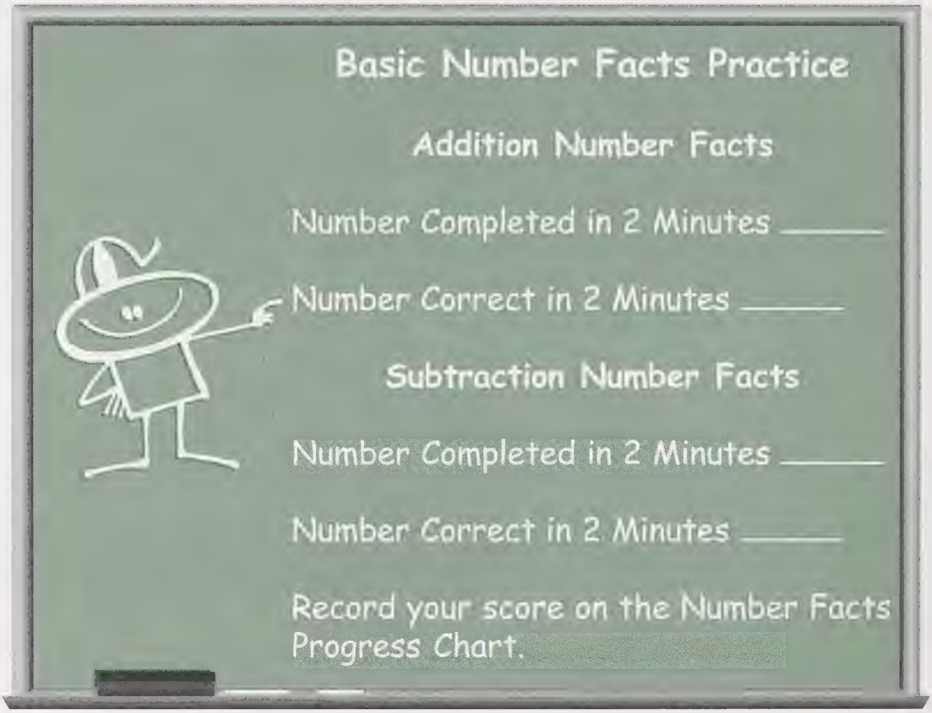
____

____

Check your answers in the Appendix.

Basic Number Facts Practice

Ask your home instructor to time you as you complete the following exercises. Your goal is to complete all 25 questions in each exercise in 2 minutes. At the end of 2 minutes, count up how many questions you were able to complete. Write this number in the chart below. Then use the answer key in the Appendix to mark the exercise, and record your score in the space provided. Before you move on, go back and complete any questions you did not finish during the 2 minutes. Mark these questions using the answer key as well.



Basic Number Facts Practice

Addition Number Facts

Number Completed in 2 Minutes ______

Number Correct in 2 Minutes ______

Subtraction Number Facts

Number Completed in 2 Minutes ______

Number Correct in 2 Minutes ______

Record your score on the Number Facts Progress Chart.

5. Addition Number Facts
Timed Exercise: 2 minutes

$\begin{array}{r} 5 \\ +\ 9 \\ \hline \end{array}$ $\begin{array}{r} 9 \\ +\ 3 \\ \hline \end{array}$ $\begin{array}{r} 6 \\ +\ 8 \\ \hline \end{array}$ $\begin{array}{r} 7 \\ +\ 9 \\ \hline \end{array}$ $\begin{array}{r} 5 \\ +\ 7 \\ \hline \end{array}$

$5 + 8 =$ $9 + 4 =$ $7 + 7 =$ $9 + 9 =$ $7 + 6 =$

$\begin{array}{r} 8 \\ +\ 8 \\ \hline \end{array}$ $\begin{array}{r} 9 \\ +\ 6 \\ \hline \end{array}$ $\begin{array}{r} 9 \\ +\ 8 \\ \hline \end{array}$ $\begin{array}{r} 8 \\ +\ 7 \\ \hline \end{array}$ $\begin{array}{r} 4 \\ +\ 9 \\ \hline \end{array}$

$9 + 7 =$ $8 + 9 =$ $6 + 7 =$ $9 + 5 =$ $6 + 6 =$

$\begin{array}{r} 8 \\ +\ 6 \\ \hline \end{array}$ $\begin{array}{r} 7 \\ +\ 8 \\ \hline \end{array}$ $\begin{array}{r} 8 \\ +\ 5 \\ \hline \end{array}$ $\begin{array}{r} 4 \\ +\ 7 \\ \hline \end{array}$ $\begin{array}{r} 6 \\ +\ 9 \\ \hline \end{array}$

Check your answers in the Appendix.

STOP

6. Subtraction Number Facts
Timed Exercise: 2 minutes

$$\begin{array}{r} 14 \\ -\;\;8 \\ \hline \end{array} \qquad \begin{array}{r} 15 \\ -\;\;9 \\ \hline \end{array} \qquad \begin{array}{r} 16 \\ -\;\;8 \\ \hline \end{array} \qquad \begin{array}{r} 13 \\ -\;\;5 \\ \hline \end{array} \qquad \begin{array}{r} 14 \\ -\;\;5 \\ \hline \end{array}$$

$15 - 7 =$ $\qquad$ $16 - 9 =$ $\qquad$ $17 - 8 =$ $\qquad$ $13 - 9 =$ $\qquad$ $12 - 9 =$

$$\begin{array}{r} 13 \\ -\;\;8 \\ \hline \end{array} \qquad \begin{array}{r} 13 \\ -\;\;6 \\ \hline \end{array} \qquad \begin{array}{r} 17 \\ -\;\;9 \\ \hline \end{array} \qquad \begin{array}{r} 14 \\ -\;\;7 \\ \hline \end{array} \qquad \begin{array}{r} 14 \\ -\;\;6 \\ \hline \end{array}$$

$11 - 4 =$ $\qquad$ $14 - 9 =$ $\qquad$ $15 - 8 =$ $\qquad$ $18 - 9 =$ $\qquad$ $16 - 7 =$

$$\begin{array}{r} 15 \\ -\;\;6 \\ \hline \end{array} \qquad \begin{array}{r} 12 \\ -\;\;6 \\ \hline \end{array} \qquad \begin{array}{r} 13 \\ -\;\;4 \\ \hline \end{array} \qquad \begin{array}{r} 13 \\ -\;\;7 \\ \hline \end{array} \qquad \begin{array}{r} 12 \\ -\;\;5 \\ \hline \end{array}$$

Turn to Assignment Booklet 4B, and complete the activities for Day 13.

Putting It All Together

In Section 2 you continued your investigation of addition and subtraction. The major concepts you studied were

- adding and subtracting large numbers
- problem solving
- adding and subtracting decimal numbers
- choosing a calculation method

Today you will review what you studied about addition and subtraction by completing several activities.

Part 1: Reviewing the Concepts

Today you will show what you have learned about the operations of adding and subtracting by completing the activities for Day 14 in Assignment Booklet 4B. First, you may wish to look back through the Student Module Booklet to review the concepts covered in Section 2.

Part 2: Challenge Activities

The Challenge Activities are designed to extend the ideas you have been learning, and encourage you to explore new ideas about adding and subtracting. In your Assignment Booklet you will find two Challenge Activities. Choose **either** Activity A **or** Activity B. (You may do both if you wish.)

Turn to Assignment Booklet 4B, and complete the review activities in Part 1. Then do one or both of the Challenge Activities in Part 2.

Assessing What You Know (II)

Today is the last day you will be working in Section 2. You will complete three activities in Assignment Booklet 4B:

- Showing What You Can Do
- Basic Number Facts
- Thinking About What You Know

Read the explanation of the activities in Parts 1, 2, and 3 before turning to Assignment Booklet 4B. Note that you will need the help of your home instructor for the activities in Parts 1 and 2.

Part 1: Showing What You Can Do

For this activity you will need the help of your home instructor. You will be working on a short activity while your home instructor observes you. As you work through the problem, try to explain clearly what you are doing.

Your home instructor may ask you questions such as the following:

- "How do you know that?"
- "Why did you decide to do that?"
- "How did you get that answer?"

Your job is to explain what you are doing so that your home instructor can understand your thinking.

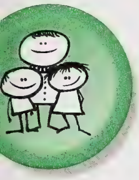
Note to the Home Instructor

This performance assessment should take about 15 minutes. The Home Instructor's Assessment Page and accompanying Student's Assessment Page can be found in Day 15 of Assignment Booklet 4B. Remove both pages from the Assignment Booklet. Read over the student's page so you are familiar with the student's assigned task. You should also preview the interview questions and the checklist before the student begins working on the assigned task.

As the student works to answer the questions, encourage him or her to talk about what he or she is doing. **Allow the student to use any manipulatives or cut-out learning aids available to help solve the problem**. You may or may not wish to use some of the interview questions. Look for understanding and the student's ability to explain clearly what he or she is doing to arrive at an answer. Indicate on the checklist whether you feel the student demonstrated the skills being assessed.

Attach both assessment pages to the Assignment Booklet before sending it in for marking.

Part 2: Basic Number Facts



In this activity you will show how well you are doing at learning your basic number facts for addition and subtraction. Ask your home instuctor to time you as you do each test.

Part 3: Thinking About What You Know

In this activity you will spend some time looking back over the work you have done in the Student Module Booklet. Then you will complete some statements that tell about things you liked about the module, things you didn't understand, and things you would like to learn more about. This information will be helpful to your teacher in determining how well you understood the information presented in the module.

When your home instructor is ready, turn to Assignment Booklet 4B and complete the activites found in Parts 1, 2, and 3 of Day 15.

This is the end of Section 2. Check over Assignment Booklet 4B to make sure you have completed all of the assigned activities for each day. Remember that for Day 14 you need to complete the Review Activities and either Activity A or Activity B in the Challenge Activities.

Also, be sure to attach the **two** assessment pages from Day 15 to Assignment Booklet 4B. Then send Assignment Booklet 4B to your teacher.

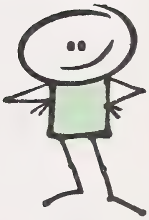
Appendix

Glossary

Answer Key to Self-Marking Activities

Cut-Out Learning Aids

Number Facts Progress Chart



Glossary

addend: a number that is added in an addition problem

For example, in $6+5=11$, 6 and 5 are the addends.

basic number facts: the addition and subtraction number statements usually made up of two numbers whose sum is 18 or less (for example, $8+9=17$, $17-9=8$); and the multiplication and division number statements made up of numbers involved in products up to 81 (for example, $9\times 7=63$, $63\div 7=9$)

difference: the answer when one number is subtracted from another

digit: any of the numerals (0, 1, 2, 3, 4, 5, 6, 7, 8, 9) used to write numbers

The number 684 has three digits. The last digit is 4.

estimate: to make a careful guess that is close to the actual value without calculating the exact value

operation: one of the four calculation procedures—addition, subtraction, multiplication, or division

Order Property for Addition: the mathematical rule which states that when two numbers are added together, changing the order of the addends does not change the sum

$3+4=7$ $\qquad$ $4+3=7$

sum: the answer found when two or more numbers are added together

Zero Property for Addition: the mathematical rule which states that whenever zero is added to a number, the number does not change

$8+0=8$ $\qquad$ $0+29=29$

Answer Key to Self-Marking Activities

Day 1: Making Sense of Operations

1. **a.** add or multiply **b.** add or multiply **c.** subtract
   d. add or multiply **e.** subtract

2. Many answers are possible. A sample answer is given.

   The ice-cream stand sold 69 ice-cream cones on Saturday. It sold 78 ice-cream cones on Sunday. How many were sold altogether?

3. Your story problem should involve something being combined or added. For example, you may be combining the number of ice-cream cones sold over two days.

4. $9 - 4 = \square$

   $9 - 4 = 5$

5. **a.** Operation: multiplication

   Number sentence: $4 \times 3 = 12$

   Word answer: 12 frogs

   b. Operation: division

   Number sentence: $12 \div 6 = 2$

   Word answer: 2 frogs

   c. Operation: subtraction

   Number sentence: $12 - 6 = 6$

   Word answer: 6 frogs

   d. Operation: addition

   Number sentence: $4 + 8 = 12$

   Word answer: 12 frogs in all

Day 2: Addition and Subtraction Number Facts

1. The answer will be the same (9). You know this because the order of addends does not change the sum.

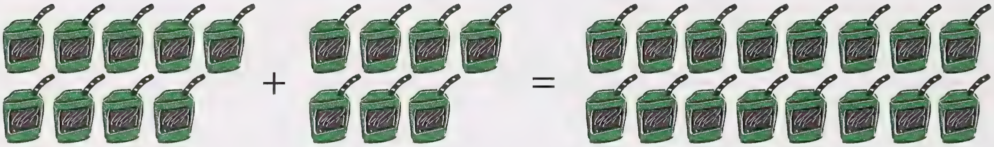
2. $$\begin{aligned}&(2+4)+5\\&= 6 + 5\\&= 11\end{aligned}$$

   $$\begin{aligned}&2+(4+5)\\&= 2 + 9\\&= 11\end{aligned}$$

   $$\begin{aligned}&(2+5)+4\\&= 7 + 4\\&= 11\end{aligned}$$

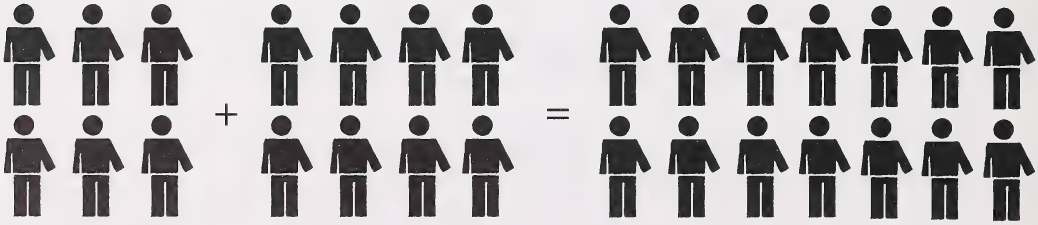
3.

+	0	1	2	3	4	5	6	7	8	9
0	0	1	2	3	4	5	6	7	8	9
1	1	2	3	4	5	6	7	8	9	10
2	2	3	4	5	6	7	8	9	10	11
3	3	4	5	6	7	8	9	10	11	12
4	4	5	6	7	8	9	10	11	12	13
5	5	6	7	8	9	10	11	12	13	14
6	6	7	8	9	10	11	12	13	14	15
7	7	8	9	10	11	12	13	14	15	16
8	8	9	10	11	12	13	14	15	16	17
9	9	10	11	12	13	14	15	16	17	18

4. a. 

$9 + 7 = \square$

$9 + 7 = 16$

b. 

$6 + 8 = \square$

$6 + 8 = 14$

5. The number in the box will be 7. If you add the last two numbers in a subtraction basic fact (4, 7) they will always equal the first number (11). If one of the last two numbers is missing, subtract the one that is there (4) from the first number (11).

$11 - \boxed{} = 4$

Subtract 4 from 11.

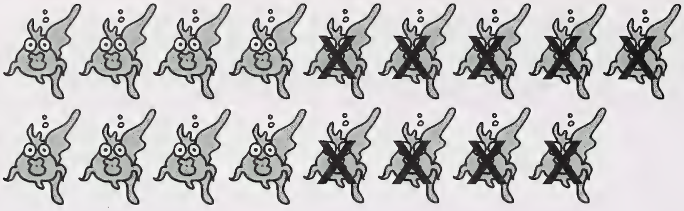
$11 - 4 = 7$

Therefore, $11 - \boxed{7} = 4$.

6.

	Column I	Column II
a.	6 + 7 = **13**	13 − 6 = 7 or 13 − 7 = 6
b.	5 + 9 = **14**	14 − 5 = 9 or 14 − 9 = 5
c.	8 + 7 = **15**	15 − 8 = 7 or 15 − 7 = 8
d.	9 + 4 = **13**	13 − 9 = 4 or 13 − 4 = 9
e.	8 + 9 = **17**	17 − 8 = 9 or 17 − 9 = 8
f.	4 + 8 = **12**	12 − 4 = 8 or 12 − 8 = 4
g.	6 + 9 = **15**	15 − 6 = 9 or 15 − 9 = 6
h.	7 + 7 = **14**	14 − 7 = 7
i.	8 + 6 = **14**	14 − 8 = 6 or 14 − 6 = 8

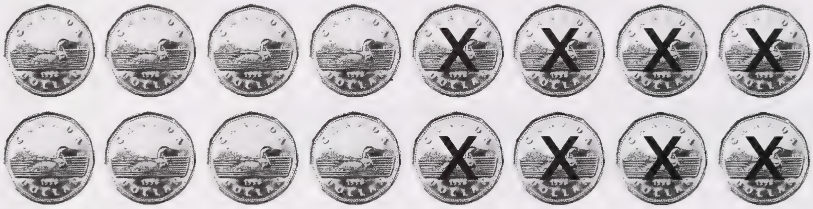
7. a.



17 − 9 = 8

Fran has 8 guppies left.

b.



16 − 8 = 8

Susan has $8 left.

8. Addition Number Facts

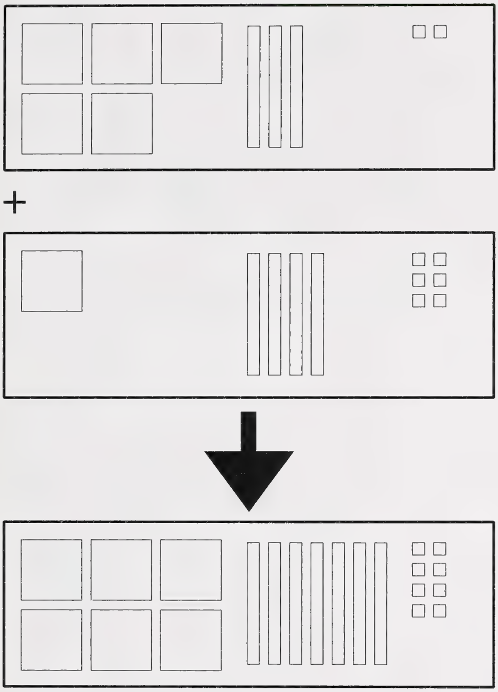
15	13	17	14	14
12	18	13	14	14
13	16	16	13	17
15	13	15	16	11
14	13	12	12	15

9. Subtraction Number Facts

9	7	9	6	4
5	7	2	8	9
8	3	9	8	6
7	7	4	9	8
9	8	7	5	8

Day 3: Adding Whole Numbers

1.



532

+ 146

678

2. **a.** 99 **b.** 883 **c.** 66 **d.** 458 **e.** 53

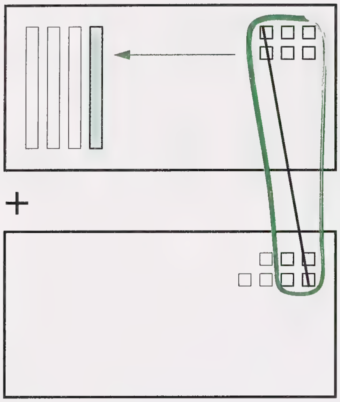
3. **a.** 26 **b.** 390 **c.** 741

4. **a.** sixty-five
   b. two hundred nine
   c. one hundred eighty-eight

5. **a.** 96 **b.** 74 **c.** 45 **d.** 80 **e.** 73

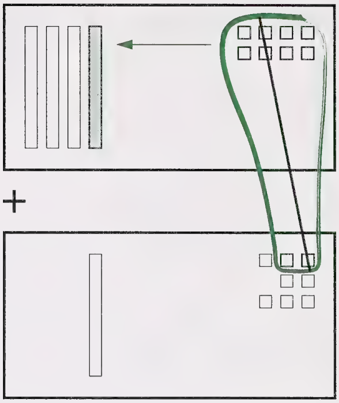
6. **a.** 651 **b.** 765 **c.** 630 **d.** 810 **e.** 817

7. a.



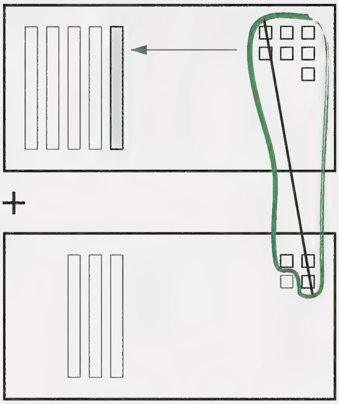
= 43

b.



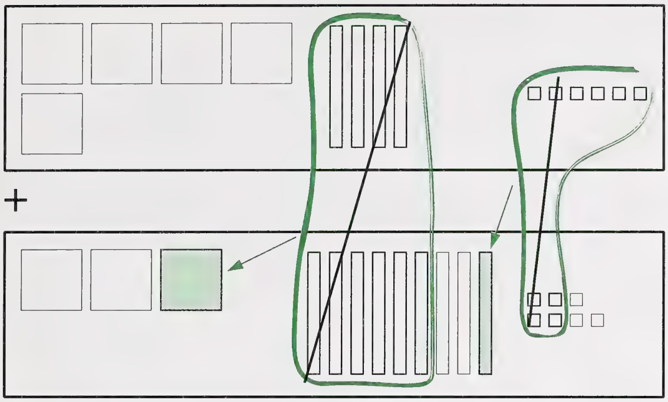
= 56

c.



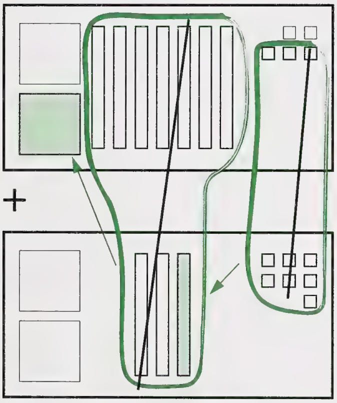
= 81

8.



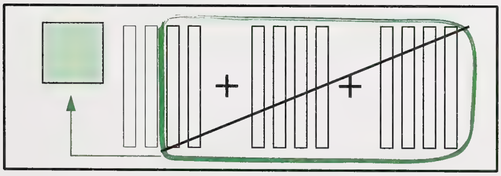
$= 833$

9. a.



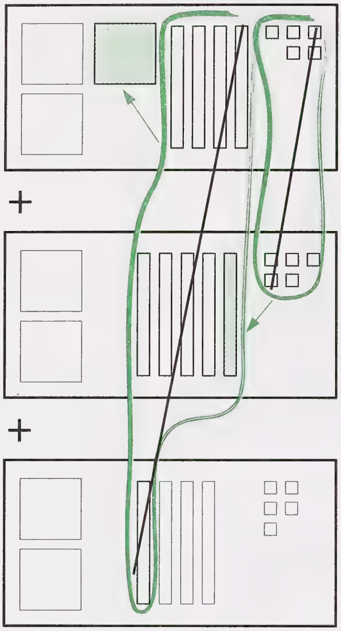
$= 402$

b.



$= 120$

c.



= 735

Taking Another Look

1. 121
2. 375
3. 673
4. 124
5. 151
6. $9.24
7. 1063
8. 853
9. $16.01
10. 1121

Day 4: Addition Strategies

1. $69 + 78 = 147$

2. Three different methods of solving the problem are shown. You should have found the same sum regardless of the method you used.

Method 1

$$\begin{array}{rl} 697 & \\ +\ 842 & \\ \hline 1400 & \text{Add the hundreds.} \\ 130 & \text{Add the tens.} \\ +\ \ \ 9 & \text{Add the ones.} \\ \hline 1539 & \end{array}$$

Method 2

$697 + 842$

First: Round 697 to 700. (Add 3.)

Next: Add 700 to 842.

$$700 + 842 = 1542$$

Last: Subtract 3 from 1542.

$$1542 - 3 = 1539$$

Method 3

$$\begin{array}{rl} \overset{1}{6}97 & \text{Add columns beginning at right,} \\ +\ 842 & \text{and regroup as you move left.} \\ \hline 1539 & \end{array}$$

3. Three methods of solving the problem are shown. You should have shown two methods. Your answer for the sum should be the same, regardless of the methods you used.

Method 1

$$\begin{array}{r} {\scriptstyle 1\,1} \\ 596 \\ +\ 329 \\ \hline 925 \end{array}$$

Add columns beginning at right, and regroup as you move left.

Method 2

$596 + 329$

First: Round 596 to 600. (Add 4.)

Next: Add 600 to 329.

$$600 + 329 = 929$$

Last: Subtract 4 from 929.

$$929 - 4 = 925$$

Method 3

$$\begin{array}{rl} 596 & \\ +\ 329 & \\ \hline 800 & \text{Add the hundreds.} \\ 110 & \text{Add the tens.} \\ +\ \ 15 & \text{Add the ones.} \\ \hline 925 & \end{array}$$

4. a.

$$\begin{array}{rr|r} & \textbf{Estimate} & \textbf{Exact} \\ & & {\scriptstyle 1} \\ 38 \rightarrow & 40 & 38 \\ +\ 58 \rightarrow & +\ 60 & +\ 58 \\ \hline & 100 & 96 \end{array}$$

b.

$$\begin{array}{rr|r} & \textbf{Estimate} & \textbf{Exact} \\ & & {\scriptstyle 1\,1} \\ 629 \rightarrow & 600 & 629 \\ +\ 284 \rightarrow & +\ 300 & +\ 284 \\ \hline & 900 & 913 \end{array}$$

c.

$$\begin{array}{rr|r} & \textbf{Estimate} & \textbf{Exact} \\ & & {\scriptstyle 1\,1} \\ 397 \rightarrow & 400 & 397 \\ +\ \ 74 \rightarrow & +\ 100 & +\ \ 74 \\ \hline & 500 & 471 \end{array}$$

5. a.

$$\begin{array}{rr} 252 \rightarrow & 300 \\ 445 \rightarrow & 400 \\ \underline{+\ 697} \rightarrow & \underline{+\ 700} \\ & 1400 \end{array}$$

About 1400 birds were counted.

b.

Estimate	**Exact**
$\begin{array}{rr} 229 \rightarrow & 200 \\ \underline{+\ 284} \rightarrow & \underline{+\ 300} \\ & 500 \end{array}$	$\begin{array}{r} {}^{1\,1} \\ 229 \\ \underline{+\ 284} \\ 513 \end{array}$

c.

Exact	**Estimate**
$\begin{array}{r} {}^{1\,1} \\ 445 \\ 505 \\ \underline{+\ 294} \\ 1244 \end{array}$	$\begin{array}{rr} 445 \rightarrow & 400 \\ 505 \rightarrow & 500 \\ \underline{+\ 294} \rightarrow & \underline{+\ 300} \\ & 1200 \end{array}$

6. Addition Number Facts

14	18	12	14	13
16	13	13	15	14
12	16	16	12	15
15	17	13	15	17
14	12	13	14	12

7. Subtraction Number Facts

8	5	8	6	8
7	3	9	5	6
4	7	7	9	9
8	7	9	7	8
4	9	6	5	9

Day 5: Subtracting Whole Numbers

1. a. 551 **b.** 115 **c.** 311 **d.** 340 **e.** 493

2. a.

$$\begin{array}{r} 396 \\ -\ 273 \\ \hline 123 \end{array}$$

123 more baseball cards

b.

$$\begin{array}{r} 248 \\ -\ 137 \\ \hline 111 \end{array}$$

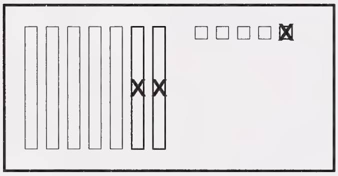
111 coins

c.

$$\begin{array}{r} 765 \\ -\ 325 \\ \hline 440 \end{array}$$

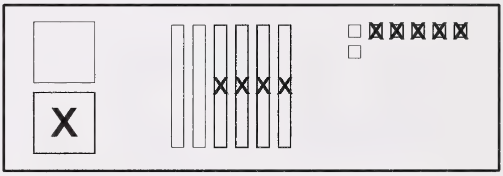
440 boys

3. a.



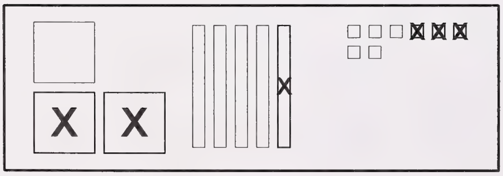
$75 - 21 = 54$

b.



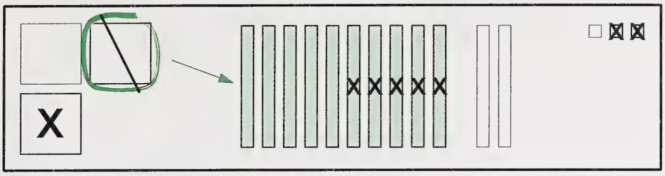
$267 - 145 = 122$

c.



$358 - 213 = 145$

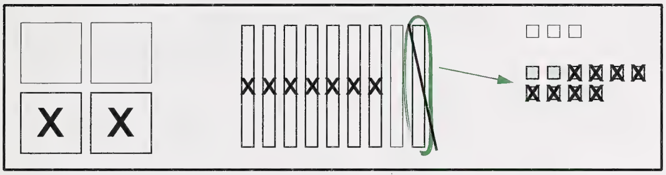
4. a.



Subtract 152.

$= 171$

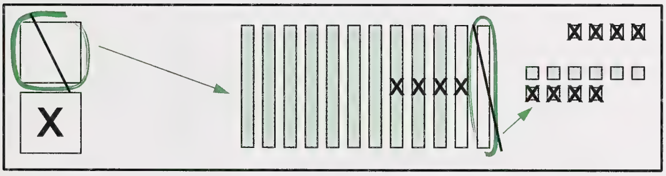
b.



Subtract 278.

$= 215$

c.



Subtract 148.

$= 76$

5. a. 37	**b.** 282	**c.** 88	**d.** 152	**e.** 254

Taking Another Look

1. 459	**2.** 468	**3.** 298	**4.** 586	**5.** 409
6. \$2.18	**7.** 177	**8.** 9	**9.** 639	**10.** \$3.08

Day 6: Subtraction Strategies

1. Many answers are possible. Some examples are provided for you.

Method 1

Subtract in columns, beginning at the right, and regroup as needed.

$$\begin{array}{r} \overset{3}{\cancel{4}}\,\overset{15}{\cancel{6}}\,\overset{11}{\cancel{1}} \\ -\ 2\,9\,3 \\ \hline 1\,6\,8 \end{array}$$

Method 2

$461 - 293$

First: Round 293 to 300 (Add 7).

Next: Subtract 300 from 461.

$$461 - 300 = 161$$

Last: Add 7 to 161.

$$161 + 7 = 168$$

2. a.

Estimate

$$\begin{array}{rcr} 81 & \rightarrow & 80 \\ -\ 38 & \rightarrow & -\ 40 \\ \cline{1-1}\cline{3-3} & & 40 \end{array}$$

Exact

$$\begin{array}{r} \overset{7}{\cancel{8}}\,\overset{11}{\cancel{1}} \\ -\ 3\,8 \\ \hline 4\,3 \end{array}$$

b.

Estimate

$$\begin{array}{rcr} 785 & \rightarrow & 800 \\ -\ 266 & \rightarrow & -\ 300 \\ \cline{1-1}\cline{3-3} & & 500 \end{array}$$

Exact

$$\begin{array}{r} 7\,\overset{7}{\cancel{8}}\,\overset{15}{\cancel{5}} \\ -\ 2\,6\,6 \\ \hline 5\,1\,9 \end{array}$$

c.

Estimate

$$\begin{array}{rcr} 572 & \rightarrow & 600 \\ -\ 164 & \rightarrow & -\ 200 \\ \cline{1-1}\cline{3-3} & & 400 \end{array}$$

Exact

$$\begin{array}{r} 5\,\overset{6}{\cancel{7}}\,\overset{12}{\cancel{2}} \\ -\ 1\,6\,4 \\ \hline 4\,0\,8 \end{array}$$

3. a.

$$\begin{array}{rcr} 376 & \rightarrow & 400 \\ -\ 297 & \rightarrow & -\ 300 \\ \cline{1-1}\cline{3-3} & & 100 \end{array}$$

about 100 more comic books

b.

$$\begin{array}{rcr} 484 & \rightarrow & 500 \\ -\ 175 & \rightarrow & -\ 200 \\ \cline{1-1}\cline{3-3} & & 300 \end{array}$$

about 300 cattle

c.

$$\begin{array}{rcr} 482 & \rightarrow & 500 \\ -\ 265 & \rightarrow & -\ 300 \\ \cline{1-1}\cline{3-3} & & 200 \end{array}$$

about 200 more books

4. a. 256 **b.** 345 **c.** 417

5. a.

$$\begin{array}{r|r} & \textbf{Check} \\ & \scriptstyle 1 \\ 24 & 17 \\ -\ 17 & +\ 13 \\ \hline 13 & 30 \end{array}$$

30 does not match 24. The subtraction needs to be done again.

$$\begin{array}{r|r} & \textbf{Check} \\ \scriptstyle 1\ 14 & \scriptstyle 1 \\ \cancel{2}\,\cancel{4} & 17 \\ -\ 1\ 7 & +\ \ 7 \\ \hline 7 & 24 \end{array}$$

b.

$$\begin{array}{r|r} & \textbf{Check} \\ & \scriptstyle 1 \\ 353 & 314 \\ -\ \ 39 & +\ \ 39 \\ \hline 314 & 353 \end{array}$$

353 matches 353. The answer 314 is correct.

c.

$$\begin{array}{r|r} & \textbf{Check} \\ & \scriptstyle 1\ 1 \\ 416 & 128 \\ -\ 128 & +\ 298 \\ \hline 298 & 426 \end{array}$$

426 does not match 416. The subtraction needs to be done again.

$$\begin{array}{r|r} & \textbf{Check} \\ \scriptstyle 3\ 10\ 16 & \scriptstyle 1\ 1 \\ \cancel{4}\,\cancel{1}\,\cancel{6} & 128 \\ -\ 1\ 2\ 8 & +\ 288 \\ \hline 2\ 8\ 8 & 416 \end{array}$$

6. a.

$$\begin{array}{r|r} & \textbf{Check} \\ \scriptstyle 0\ 15 & \\ \cancel{1}\,\cancel{5}\,6 & 93 \\ -\ \ 9\ 3 & +\ \ 63 \\ \hline 6\ 3 & 156 \end{array}$$

b.

$$\begin{array}{r|r} & \textbf{Check} \\ \scriptstyle 5\ 12 & \scriptstyle 1 \\ 5\,\cancel{6}\,\cancel{2} & 453 \\ -\ 45\ 3 & +\ 109 \\ \hline 10\ 9 & 562 \end{array}$$

c.

$$\begin{array}{r|r} & \textbf{Check} \\ \scriptstyle 3\ 9\ 14 & \scriptstyle 1\ 1 \\ \cancel{4}\,\cancel{0}\,\cancel{4} & 139 \\ -\ 1\ 3\ 9 & +\ 265 \\ \hline 2\ 6\ 5 & 404 \end{array}$$

7. The reverse operation for checking addition is subtraction. When you subtract one of the addends from the sum, you will get the other addend.

Example **Reverse Operation**

$$\begin{array}{r} \text{Addend} \rightarrow \\ \text{Addend} \rightarrow \\ \text{Sum} \rightarrow \end{array} \quad \begin{array}{r} 6 \\ +\ 7 \\ \hline 13 \end{array} \quad \longleftrightarrow \quad \begin{array}{r} 13 \\ -\ 7 \\ \hline 6 \end{array}$$

8. **a.** **Check**

$$\begin{array}{r} \overset{1}{2}18 \\ +\ 437 \\ \hline 655 \end{array} \quad \longleftrightarrow \quad \begin{array}{r} 6\overset{4}{\cancel{5}}\overset{15}{\cancel{5}} \\ -\ 437 \\ \hline 218 \end{array}$$

b. **Check**

$$\begin{array}{r} \overset{3}{\cancel{4}}\overset{12}{\cancel{3}}\overset{10}{\cancel{0}} \\ -\ 394 \\ \hline 36 \end{array} \quad \longleftrightarrow \quad \begin{array}{r} \overset{1\ 1}{36} \\ +\ 394 \\ \hline 430 \end{array}$$

c. **Check**

$$\begin{array}{r} \overset{1}{5}\overset{1}{6}7 \\ +\ 75 \\ \hline 642 \end{array} \quad \longleftrightarrow \quad \begin{array}{r} \overset{5}{\cancel{6}}\overset{13}{\cancel{4}}\overset{12}{\cancel{2}} \\ -\ 75 \\ \hline 567 \end{array}$$

Day 7: Assessing What You Know (I)

Complete your Day 7 activities in Assignment Booklet 4A. This work will be marked by your teacher.

Day 8: Adding and Subtracting Large Numbers

1. **a.** $\begin{array}{r} \overset{1}{4}8 \\ +\ 23 \\ \hline 71 \end{array}$ **b.** $\begin{array}{r} \overset{1}{3}7 \\ +\ 96 \\ \hline 133 \end{array}$ **c.** $\begin{array}{r} \overset{1}{8}\overset{1}{9}3 \\ +\ 58 \\ \hline 951 \end{array}$ **d.** $\begin{array}{r} \overset{1}{5}\overset{1}{4}5 \\ +\ 676 \\ \hline 1221 \end{array}$

2. **a.** $\begin{array}{r} \overset{1}{1}3\overset{1}{4}8 \\ +\ 6724 \\ \hline 8072 \end{array}$ **b.** $\begin{array}{r} 6\overset{1}{0}\overset{1}{3}1 \\ +\ 3779 \\ \hline 9810 \end{array}$ **c.** $\begin{array}{r} 7\overset{1}{4}\overset{1}{5}9 \\ +\ 456 \\ \hline 7915 \end{array}$ **d.** $\begin{array}{r} \overset{1}{2}\overset{1}{2}\overset{1}{1}1 \\ +\ 999 \\ \hline 3210 \end{array}$

3. a.

$$\begin{array}{rrrrr} & & {\scriptstyle 7} & {\scriptstyle 17} & {\scriptstyle 12} \\ & 4 & \cancel{8} & \cancel{8} & \cancel{2} \\ - & 2 & 7 & 9 & 5 \\ \hline & 2 & 0 & 8 & 7 \end{array}$$

b.

$$\begin{array}{rrrrr} & {\scriptstyle 6} & {\scriptstyle 10} & {\scriptstyle 17} & {\scriptstyle 14} \\ & \cancel{7} & \cancel{1} & \cancel{8} & \cancel{4} \\ - & & 4 & 8 & 6 \\ \hline & 6 & 6 & 9 & 8 \end{array}$$

c.

$$\begin{array}{rrrrr} & & {\scriptstyle 5} & {\scriptstyle 16} & {\scriptstyle 11} \\ & \cancel{6} & \cancel{6} & \cancel{7} & \cancel{1} \\ - & 2 & 5 & 9 & 5 \\ \hline & 4 & 0 & 7 & 6 \end{array}$$

d.

$$\begin{array}{rrrrr} & {\scriptstyle 4} & {\scriptstyle 10} & {\scriptstyle 10} & {\scriptstyle 11} \\ & \cancel{5} & \cancel{1} & \cancel{1} & \cancel{1} \\ - & 4 & 8 & 9 & 9 \\ \hline & & 2 & 1 & 2 \end{array}$$

4. a.

$$\begin{array}{rrrrr} & & {\scriptstyle 9} & {\scriptstyle 9} & \\ & {\scriptstyle 1} & {\scriptstyle \cancel{10}} & {\scriptstyle \cancel{10}} & {\scriptstyle 10} \\ & \cancel{2} & \cancel{0} & \cancel{0} & \cancel{0} \\ - & 1 & 2 & 8 & 6 \\ \hline & & 7 & 1 & 4 \end{array}$$

b.

$$\begin{array}{rrrrr} & & {\scriptstyle 9} & & \\ & {\scriptstyle 7} & {\scriptstyle \cancel{10}} & {\scriptstyle 14} & {\scriptstyle 10} \\ & \cancel{8} & \cancel{0} & \cancel{5} & \cancel{0} \\ - & 4 & 3 & 6 & 2 \\ \hline & 3 & 6 & 8 & 8 \end{array}$$

c.

$$\begin{array}{rrrrr} & & {\scriptstyle 9} & & \\ & {\scriptstyle 2} & {\scriptstyle \cancel{10}} & {\scriptstyle 10} & \\ & \cancel{3} & \cancel{0} & \cancel{0} & 7 \\ - & & 2 & 6 & 4 \\ \hline & 2 & 7 & 4 & 3 \end{array}$$

d.

$$\begin{array}{rrrrr} & & & {\scriptstyle 9} & \\ & {\scriptstyle 5} & {\scriptstyle 10} & {\scriptstyle \cancel{10}} & {\scriptstyle 18} \\ & \cancel{6} & \cancel{1} & \cancel{0} & \cancel{8} \\ - & 2 & 8 & 4 & 9 \\ \hline & 3 & 2 & 5 & 9 \end{array}$$

5. a.

$$\begin{array}{rrcrr} & 7884 & \rightarrow & & 8000 \\ - & 5126 & \rightarrow & - & 5000 \\ \cline{1-2}\cline{4-5} & & & & 3000 \end{array}$$

About 3000 more people attended the Friday game.

b.

$$\begin{array}{rrcrr} & 3409 & \rightarrow & & 3000 \\ & 2658 & \rightarrow & & 3000 \\ + & 2166 & \rightarrow & + & 2000 \\ \cline{1-2}\cline{4-5} & & & & 8000 \end{array}$$

About 8000 vehicles travelled on the street.

c.

$$\begin{array}{rrcrr} & 5062 & \rightarrow & & 5000 \\ - & 2895 & \rightarrow & - & 3000 \\ \cline{1-2}\cline{4-5} & & & & 2000 \end{array}$$

He deposited about $2000.

6. a. **Check**

$$\begin{array}{rrrrr} & & {\scriptstyle 1} & {\scriptstyle 1} & {\scriptstyle 1} \\ & 3 & 8 & 6 & 4 \\ + & 4 & 2 & 3 & 7 \\ \hline & 8 & 1 & 0 & 1 \end{array} \quad \longleftrightarrow \quad \begin{array}{rrrrr} & {\scriptstyle 7} & {\scriptstyle 10} & {\scriptstyle 9} & {\scriptstyle 11} \\ & \cancel{8} & \cancel{1} & \cancel{0} & \cancel{1} \\ - & 4 & 2 & 3 & 7 \\ \hline & 3 & 8 & 6 & 4 \end{array}$$

b. **Check**

$$\begin{array}{rrrrr} & {\scriptstyle 3} & {\scriptstyle 10} & {\scriptstyle 5} & {\scriptstyle 18} \\ & \cancel{4} & \cancel{0} & \cancel{6} & \cancel{8} \\ - & & 6 & 2 & 9 \\ \hline & 3 & 4 & 3 & 9 \end{array} \quad \longleftrightarrow \quad \begin{array}{rrrrr} & & {\scriptstyle 1} & & {\scriptstyle 1} \\ & 3 & 4 & 3 & 9 \\ + & & 6 & 2 & 9 \\ \hline & 4 & 0 & 6 & 8 \end{array}$$

c. **Check**

$$\begin{array}{r} \overset{5}{\cancel{6}}\,\overset{\overset{9}{\cancel{10}}}{\cancel{0}}\,\overset{\overset{9}{\cancel{10}}}{\cancel{0}}\,\overset{10}{\cancel{0}} \\ -\;1\,8\,2\,5 \\ \hline 4\,1\,7\,5 \end{array} \quad \longleftrightarrow \quad \begin{array}{r} {\scriptstyle 1\,1\,1\;\,} \\ 4175 \\ +\;1825 \\ \hline 6000 \end{array}$$

d. **Check**

$$\begin{array}{r} {\scriptstyle 1\,1\,1\;\,} \\ 1398 \\ +\;7685 \\ \hline 9083 \end{array} \quad \longleftrightarrow \quad \begin{array}{r} \overset{8}{\cancel{9}}\,\overset{\overset{9}{\cancel{10}}}{\cancel{0}}\,\overset{17}{\cancel{8}}\,\overset{13}{\cancel{3}} \\ -\;7\,6\,8\,5 \\ \hline 1\,3\,9\,8 \end{array}$$

7. **a.** Two methods of solving this problem are shown. Your method may be different, but you should have arrived at the same sum.

Method 1

Subtract in columns, beginning at the right, and regroup as needed.

$$\begin{array}{r} \overset{2}{\cancel{3}}\,\overset{\overset{9}{\cancel{10}}}{\cancel{0}}\,\overset{\overset{9}{\cancel{10}}}{\cancel{0}}\,\overset{12}{\cancel{2}} \\ -\;1\,9\,9\,9 \\ \hline 1\,0\,0\,3 \end{array}$$

Method 2

Subtract too much and then add some back.

$$\begin{array}{r} 3002 \\ -\;2000 \\ \hline 1002 \\ +\quad\;\; 1 \\ \hline 1003 \end{array}$$

b. 2000 **c.** 10 **d.** 22

e. bigger **f.** 24

8. **a.** Think: $30+10=40$
Add $2 \rightarrow 42$

b. Think: $50+50=100$
Subtract $1 \rightarrow 99$

c. Think: $67-10=57$
Add $1 \rightarrow 58$

d. Think: $93-10=83$
Subtract $1 \rightarrow 82$

e. $3005+1000=4005$

f. $8008-2000=6008$

g. Think: $4782-2000=2782$
Add $1 \rightarrow 2783$

h. Think: $2967+5000=7967$
Subtract $1 \rightarrow 7966$

i. Think: $5600+3000=8600$
Add $4 \rightarrow 8604$

j. Think: $6000-2000=4000$
Subtract $1 \rightarrow 3999$

Taking Another Look

Quest 2000 **Page 89**

Practise Your Skills

1. 398
2. 800
3. 1792
4. 7593
5. 7367
6. 212
7. 313
8. 594
9. 9058
10. 2242
11. 686
12. 1370
13. 2739
14. 6228
15. 108
16. 315
17. 2102
18. 1452

Day 9: Problem Solving

1. The Wilson family is planning a trip to the mountains.

2. There are three choices for ways to travel:

- by train
- by bus
- by car

3. There are two choices for parks to visit:

- Jasper National Park
- Banff National Park

4. There are two choices for places to stay:

- in a motel
- in a campground

5. The problem is asking you to find all the different possible trips the Wilsons could plan.

6. This is called the **Making a List** strategy

7. • one method of travel
   • one park to visit
   • one place to stay

8. Yes, if you travel by train and visit Jasper, you could stay in a campground (instead of a motel).

9. No, there are only two choices for kind of place to stay.

10. There are four different combinations so far.

11. **a.** There will probably be 12 different trip combinations.

    b. This is probably true because for one method of travel (by train), there were four different combinations. There should be four more combinations if you change the method of travel to bus, and four more if you change the method of travel to car.

12.

Start with travelling by train. List all the combinations that can be made with travelling by train.

Next use travelling by bus and list all the combinations that can be made with the bus.

Next use travelling by car and list all the combinations that can be made with the car.

Trip Combinations

Way to Travel	Park to Visit	Place to Stay
train	Jasper	motel
train	Jasper	campground
train	Banff	motel
train	Banff	campground
bus	Jasper	motel
bus	Jasper	campground
bus	Banff	motel
bus	Banff	campground
car	Jasper	motel
car	Jasper	campground
car	Banff	motel
car	Banff	campground

The list shows that there are 12 different combinations.

13.

ANSWER TO THE PROBLEM

The Wilsons could plan any one of 12 different trips. The 12 possible trips are given in the organized list shown in the answer to question 12.

Day 10: Adding and Subtracting Decimals (Tenths)

1. a. $\frac{7}{10}$, 0.7

b. $\frac{8}{10}$, 0.8

c. $\frac{4}{10}$, 0.4

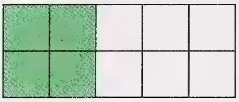
d. $\frac{5}{10}$, 0.5

e. $\frac{7}{10}$, 0.7

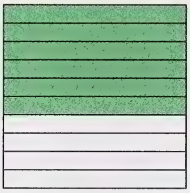
f. $\frac{6}{10}$, 0.6

2. Shadings may vary. One example is shown for each.

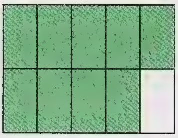
a. four tenths



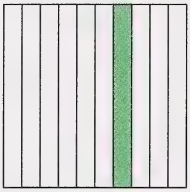
b. 0.6



c. $\frac{9}{10}$

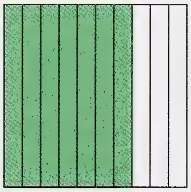


3. a.



b. $\frac{1}{10}$, 0.1

4. a.

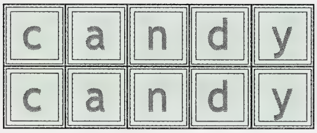


b. seven tenths

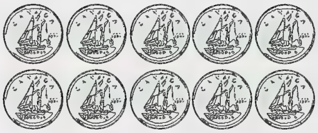
5. a. 10

b. $\frac{10}{10}$

6. a.


c a n d y
c a n d y

b.



7. a. 10 riders

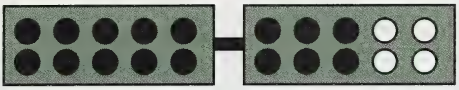
b. $\frac{6}{10}$

c. $\frac{10}{10}$

8. a. The 1 tells you that 1 whole roller coaster car is full (or $\frac{10}{10}$ of the seats in the rear car are full).

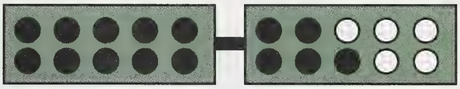
b. The .6 tells you that 6 of the 10 seats in the front car are full.

9. a.



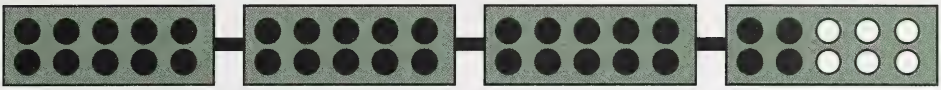
1.6 cars are full.

b.



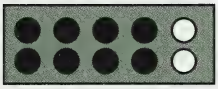
1.5 cars are full.

c.



3.4 cars are full.

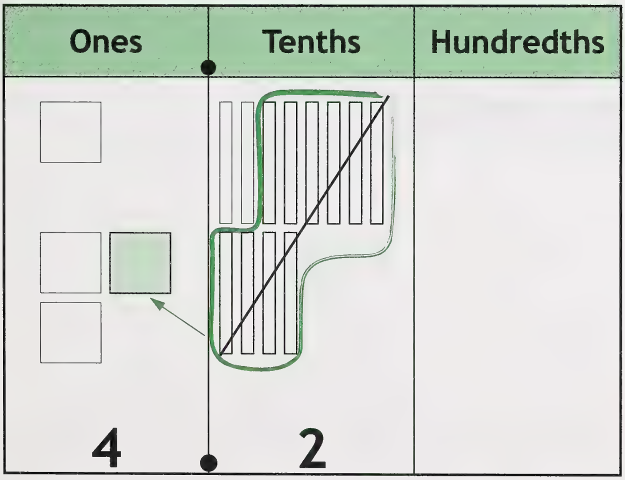
d.



0.8 cars are full.

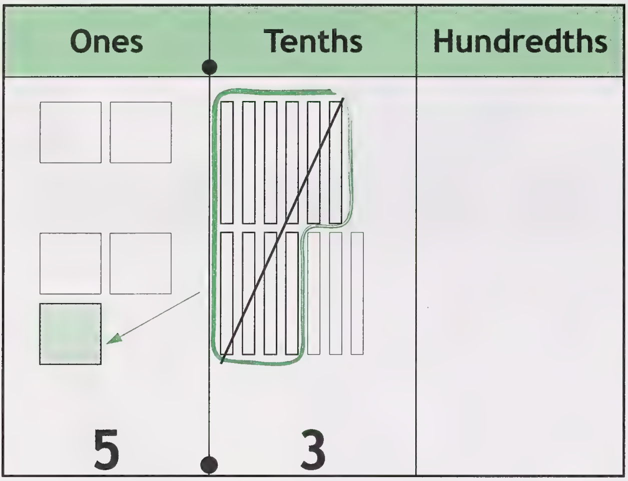
10. a. 1.7 **b.** 6.2 **c.** 4.6
d. 3.5 **e.** 3.4 **f.** 4.6

11. a. 1.8 + 2.4 =


Ones
Tenths
Hundredths
4
2

The mass of the grapes and apples is 4.2 kg.

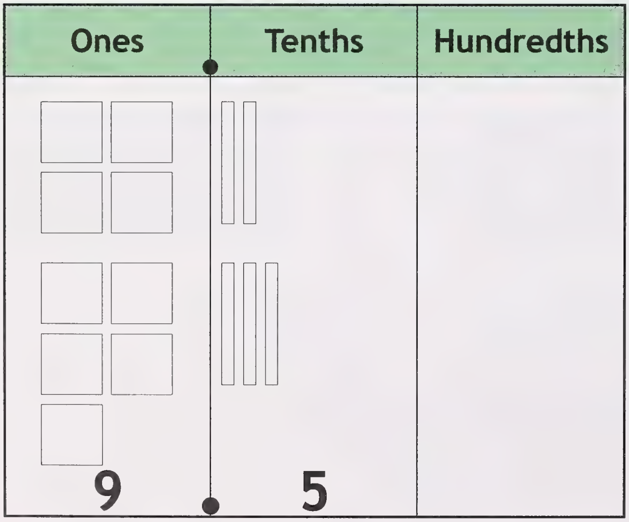
b. $2.6 + 2.7 =$


Ones
Tenths
Hundredths
5
3

The mass of the chicken and steak combined is 5.3 kg.

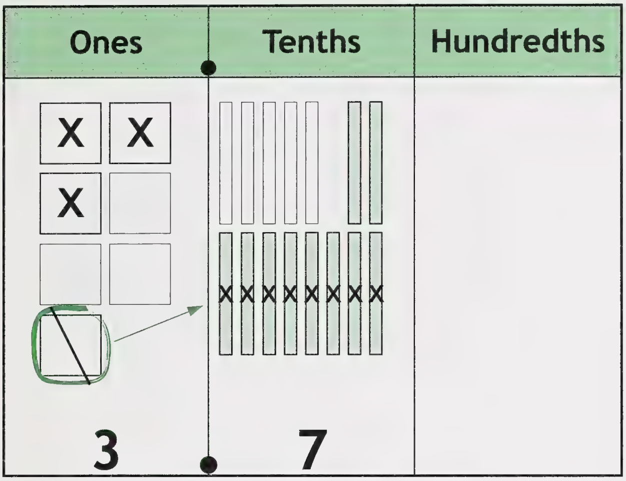
c. To find the total mass of all the groceries, you only need to add the sum from question 11 to the sum from question 12.

$4.2 + 5.3 =$


Ones
Tenths
Hundredths
9
5

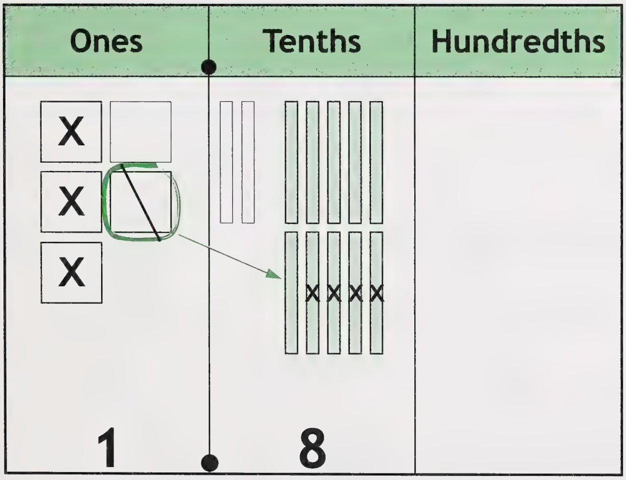
The total mass of all the groceries is 9.5 kg.

12. $7.5 - 3.8 =$


Ones
Tenths
Hundredths
X
X
X
3
7

Calvin hiked 3.7 km more in the morning.

13. $5.2 - 3.4 =$


Ones
Tenths
Hundredths
X
X
X
1
8

The piece of paper Donna cut off was 1.8 m long.

14. Addition Number Facts

14	12	14	13	17
12	17	12	13	18
14	13	15	15	13
13	15	16	15	11
14	16	16	14	13

15. Subtraction Number Facts

7	5	7	7	6
8	4	9	8	6
9	3	8	9	9
7	5	8	8	5
4	9	9	8	6

Day 11: Adding and Subtracting Decimals (Hundredths)

1. a. 0.04
four hundredths
b. 0.05
five hundredths
c. 0.07
seven hundredths

2. a. 0.02 **b.** 0.06 **c.** 0.11

3. a. Twenty Scouts are from Australia.

b. Australian flags cover **20 hundredths** $\left(\frac{20}{100}\right)$ of the graph.

c. Decimal fraction: **0.20** of the Scouts are from Australia.

4. a. Seventeen Scouts are from Japan.

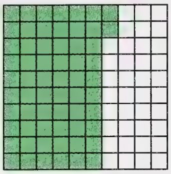
b. Japanese flags cover **17 hundredths** $\left(\frac{17}{100}\right)$ of the graph.

c. Decimal fraction: **0.17** of the Scouts are from Japan.

5. **a.** **0.12** of the Scouts are from Great Britain.
b. **0.11** of the Scouts are from Sweden.
c. **0.05** of the Scouts are from Nigeria.

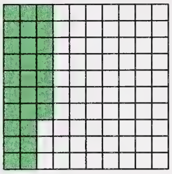
6. **a.** 0.51 **b.** 0.33 **c.** 0.40 or 0.4
d. 0.12 **e.** 0.78 **f.** 0.99

7. **a.**



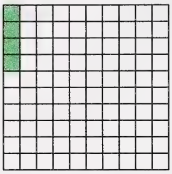
0.62

b.



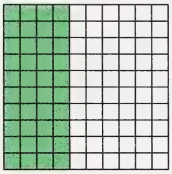
0.27

c.



0.04

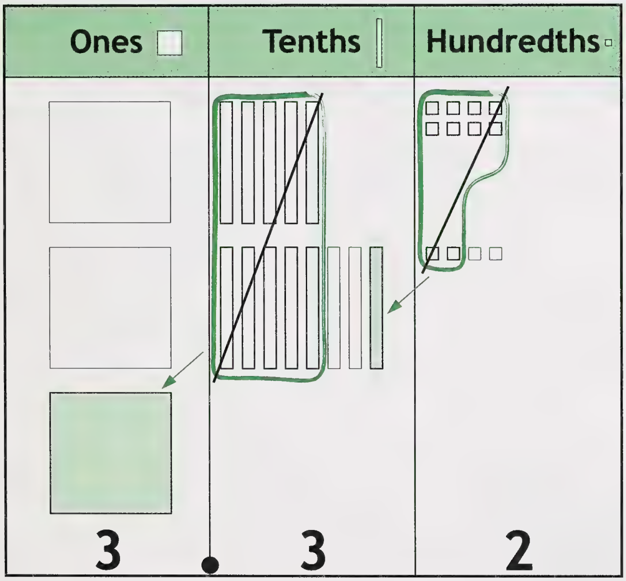
d.



0.40

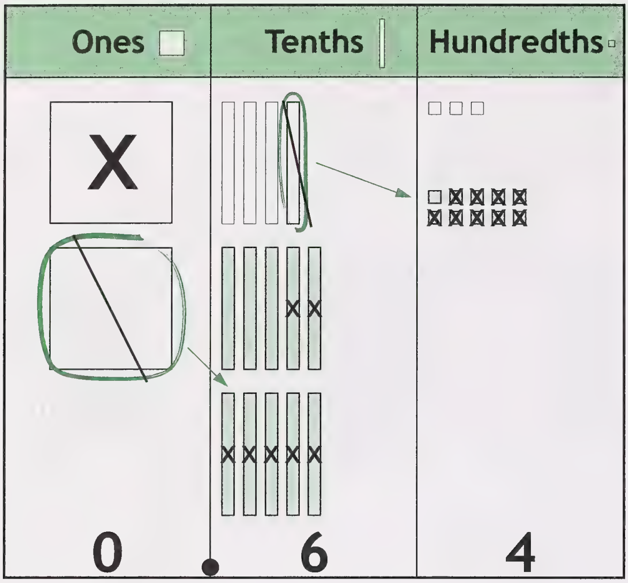
8. **a.** 4.62 **b.** 2.06 **c.** 0.15
d. 3.89 **e.** 8.09

9.



Sentence answer: The total mass of the white and brown sugar was 3.32 kg.

10.


Ones
Tenths
Hundredths
0
6
4

Sentence answer: The leftover piece of board will be 0.64 m long.

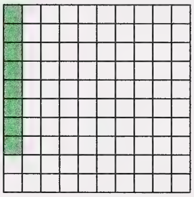
Day 12: Working with Hundredths

1. a. 100

b. 100

c. hundredth or cent

d.

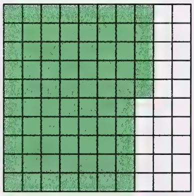


e. 8

f. 10

g. 10 hundredths

h.



2. **a.** 17¢ $0.17
   b. 5¢ $0.05
   c. 89¢ $0.89

3. **a.** $1.63
   b. $3.09
   c. $67.76

4. **a.** seventy-seven cents
   b. twelve dollars and thirty-eight cents
   c. twenty dollars and eight cents

5. 75¢ or $0.75

6. $7.50

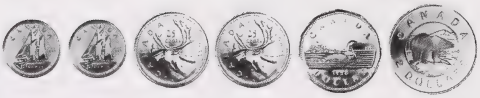
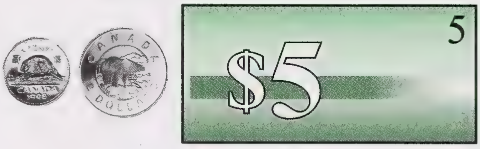
7. Many answers are possible. One mental math strategy you might have tried is to round the prices to even dollars and subtract the extra cents later.

a.	saw	$16.95	5¢ less than $17.00
	pliers	$ 6.97	3¢ less than $ 7.00
		Total	8¢ less than $24.00 or $23.92

b.	saw	$16.95	5¢ less than $17.00
	screwdriver	$ 3.98	2¢ less than $ 4.00
		Total	7¢ less than $21.00 or $20.93

c.	pliers	$6.97	3¢ less than $7.00
	pliers	$6.97	3¢ less than $7.00
		Total	6¢ less than $14.00 or $13.94

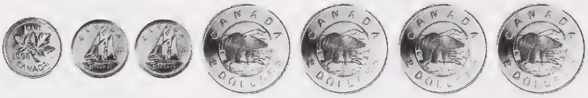
8. Several answers are possible. The change requiring the fewest number of coins is shown.

	Amount of Change	**Drawing**
a.	$3.70	
b.	$7.05	

c. Jeet bought the hockey stick.

d.
- A board game is the most expensive item that can be purchased with $5.00.
- You will get $1.65 back.
- Answers will vary. With $1.65 you could buy one of the following items:
  - – a book
  - – a stuffed animal
  - – a skipping rope

e. Carl's change was $8.21.



9. Many answers are possible. You may have said that you would round the two amounts to the nearest 10 (dollars) and then add them.

$$\begin{array}{lr}
\$98.89 \rightarrow & \$100.00 \\
\$47.49 \rightarrow + & \underline{\$\ \ 50.00} \\
\text{Estimate:} & \$150.00
\end{array}$$

Or, perhaps you said that you would round the second amount to the nearest 10 and add it onto the first amount by skip counting by 10.

$$\begin{array}{r}
\$98.89 + \$50.00 \\
98 + 10 \rightarrow 108 \\
+10 \rightarrow 118 \\
+10 \rightarrow 128 \\
+10 \rightarrow 138 \\
+10 \rightarrow 148 \\
\text{Estimate:}\$148
\end{array}$$

Or, perhaps you found your own way of estimating. If so, share your estimating method with your home instructor.

10. Many answers are possible. Two examples are given for each problem.

a. $\$27.98 + \$58.55$

Method 1: Round each amount to the nearest 10.

$$\begin{array}{lr}
\$27.98 \rightarrow & \$30.00 \\
\$58.55 \rightarrow & \underline{\$60.00} \\
 & \$90.00
\end{array}$$

$\$27.98 + \$58.55$ is about \$90.00.

Method 2: Round one amount; use it to skip count by 10.

Round \$27.98 to \$30.00.
Add \$30.00 to \$58.55.
(Count 58, 68, 78, 88.) → \$88.00
Add on the \$0.55. → \$88.55

\$27.98 + \$58.55 is a little less than \$88.55.

b. \$296.24 – \$47.89

Method 1: Round each amount to the nearest 10.

$$\begin{array}{rr} \$296.24 \rightarrow & \$300.00 \\ \$47.89 \rightarrow & -\ \$\ \ 50.00 \\ \hline & \$250.00 \end{array}$$

\$296.24 – \$47.89 is about \$250.00.

Method 2: Round the smaller amount; use it to skip count backwards by 10.

Round \$47.89 to \$50.00.
Subtract \$50.00 from \$296.24.
(Count back: 296, 286, 276, 266, 256, 246.) → \$246.00
Add on the \$0.24. → \$246.24

\$296.24 – \$47.89 is a little more than \$246.24.

11. Many methods are possible. Two examples are given.

Method 1: Counting On

Count on from the amount spent until you reach $9.00.

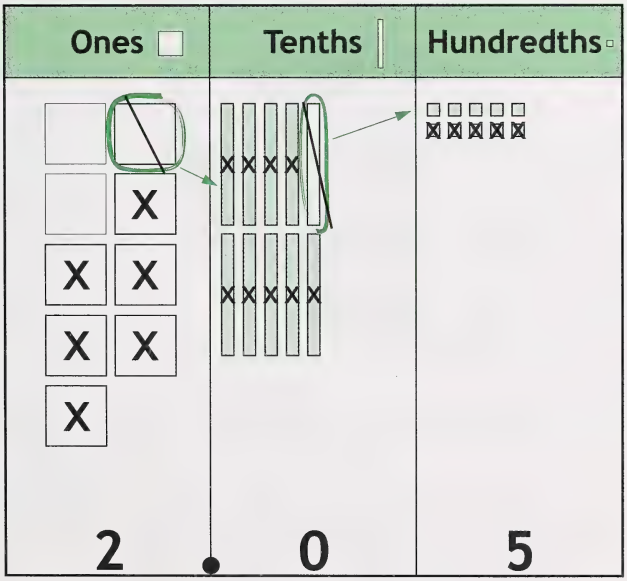
$6.95 to $7.00 is	$0.05
$7.00 to $9.00 is	$2.00
Total:	$2.05

Lorna has $2.05 left.

Method 2: Base Ten Drawings/Cutouts

$9.00 – $6.95 = ☐

Begin with 9 ones and subtract 6 ones, 9 tenths, and 5 hundredths.
(dollars) (dimes) (pennies)



This leaves 2 ones, 0 tenths, and 5 hundredths → $2.05
(dollars) (dimes) (pennies)

Lorna has $2.05 left.

12. Many methods are possible. One example is given for each question.

a.

Tetra	$5.98	2¢ less than $6.00
Black Molly	$2.97	3¢ less than $3.00
		5¢ less than $9.00 or $8.95

A tetra and a black molly would cost $8.95.

b.

Guppy	$2.99	1¢ less than $3.00
Guppy	$2.99	1¢ less than $3.00
Moonfish	$3.99	1¢ less than $4.00
		3¢ less than $10.00 or $9.97

Two guppies and a moonfish would cost $9.97.

c. Use the "counting on" method.

Count on from $2.97 until you reach $6.95.

$2.97 to $3.00 is	$0.03	
$3.00 to $6.00 is	$3.00	
$6.00 to $6.75 is	$0.75	
$6.75 to $6.95 is	$0.20	
	$3.98	

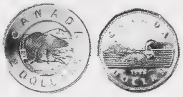
An angelfish costs $3.98 more than a black molly.

13. To find the amount of change, count on using coins from $6.52 until you reach $10.00.

$6.52 to $6.55 is $0.03

$6.55 to $6.75 is $0.20

$6.75 to $7.00 is $0.25

$7.00 to $10.00 is $3.00 

Taking Another Look

		Less than $10	Between $10 and $20	More than $20
1.	$7.43 + $2.85		✓	
2.	$12.04 – $1.95		✓	
3.	$11.78 + $9.78			✓
4.	$13.91 – $3.99	✓		
5.	$15.25 – $5.94	✓		
6.	$4.06 + $6.14		✓	
7.	$23.02 – $1.96			✓
8.	$4.45 + $4.54	✓		
9.	$9.85 + $10.55			✓
10.	$13.44 – $3.62	✓		

Day 13: Choosing a Calculation Method

1. In order to find out if $10 will be enough to pay for all of the groceries, Ann Marie would need to find the total cost of all the items. To do this, she could use the operations of addition and multiplication.

2. Several answers are possible. However, using mental math strategies or estimation by rounding are probably the two best methods of calculation in this situation. They are easily done, do not require manipulatives or a calculator, and you can find an answer quickly.

3. Several methods are possible.

- **Mental Math (Exact)**

$$\begin{array}{rl} 3\times\$0.99 & 3\times\$1(3\text{¢ too much}) = \$3.00 \\ \$2.75+\$1.25 & \$2+\$1+(75\text{¢}+25\text{¢}) = \$4.00 \\ \$1.50+\$1.50 & \$1+\$1+(50\text{¢}+50\text{¢}) = \$3.00 \\ 2\times\$0.95 & 2\times\$1(10\text{¢ too much}) = \underline{\$2.00} \end{array}$$

$$\begin{array}{lr} & \$12.00 \\ \text{Subtract } (3\text{¢}+10\text{¢}) & -\ \$0.13 \\ \hline & \$11.87 \end{array}$$

Ann Marie does not have enough money.

- **Rounding**

Cucumbers	$3\times\$1.00=\$3.00$
Potatoes	$1\times\$3.00=\$3.00$
Radishes	$2\times\$1.00=\$2.00$
Bread	$2\times\$1.50=\$3.00$
Lettuce	$1\times\$1.00=\$1.00$

Answer: about $12.00

Ann Marie does not have enough money.

4. Several answers are possible. One or more sample answers is given for each.

a. Method 1: Paper and Pencil

The method works well because each mark on the wood can be found by simply adding 4.8 cm to each previous amount. (A calculator could also be used.) This method will give you the exact measurements.

- To mark the second cut, move another 4.8 cm from the first mark.

$$4.8\ \text{cm} + 4.8\ \text{cm} = 9.6\ \text{cm}$$

- To mark the third cut, move another 4.8 cm from the second mark.

$$9.6\ \text{cm} + 4.8\ \text{cm} = 14.4\ \text{cm}$$

- Continue until you have marked all the cuts.

Method 2: Mental Math

You can mentally locate where to mark the cuts by thinking, "Since 4.8 is two tenths less than 5, to find the next point, add 5 and subtract two-tenths."

- To mark the second cut, add 5 and subtract two tenths.

$$4.8\ \text{cm} + 5\ \text{cm} = 9.8\ \text{cm}$$
$$9.8\ \text{cm} - 0.2\ \text{cm} = 9.6\ \text{cm}$$

- To mark the third cut, add 5 and subtract two-tenths.

$$9.6\ \text{cm} + 5\ \text{cm} = 14.6\ \text{cm}$$
$$14.6\ \text{cm} - 0.2\ \text{cm} = 14.4\ \text{cm}$$

This method makes the addition operation easier to do in your head and gives you the exact measurements.

b. Method 1: Mental Math

This method works well because the numbers can be easily changed to make the addition easy to do in your head. The method also gives an exact answer.

Change 68 km to 70 km. (Add 2.)
Change 19 km to 20 km. (Add 1.)

$$\begin{array}{rrl} & 70\text{ km} & \\ + & 20\text{ km} & \\ \hline & 90\text{ km} & \\ - & 3\text{ km} & \text{(Subtract 3.)} \\ \hline & 87\text{ km} & \end{array}$$

Use the same method to find the total distance travelled.

Change 87 km to 90 km. (Add 3.)
Change 87 km to 90 km. (Add 3.)

$$\begin{array}{rrl} & 90\text{ km} & \\ + & 90\text{ km} & \\ \hline & 180\text{ km} & \\ - & 6\text{ km} & \text{(Subtract 6.)} \\ \hline & 174\text{ km} & \end{array}$$

Method 2: Pencil and Paper or Calculator

These two methods could also be used. They would be accurate and give an exact answer.

Distance to Two Hills

$$\begin{array}{rr} & 68\text{ km} \\ + & 19\text{ km} \\ \hline & 87\text{ km} \end{array}$$

Total Distance Travelled

$$\begin{array}{rr} & 87\text{ km} \\ + & 87\text{ km} \\ \hline & 174\text{ km} \end{array}$$

The disadvantage of this method is paper, a pencil, and/or a calculator is needed, and might not be available in the car.

c. Method 1: Estimation

Using estimation would be a good method because you can easily round 195 beads to 200 beads and then calculate in your head the number of necklaces you can make from one package of beads. The answer will **not** be exact, but will be close enough to allow you to calculate how many packages of beads are needed to make 20 necklaces.

Round 195 to 200.
One necklace requires about 200 beads.
Therefore, 1 package (1000 beads) will make about 5 necklaces.

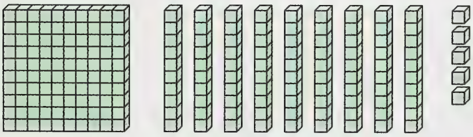
$$5 \times 200 = 1000 \text{ beads}$$

1 package of beads → 5 necklaces
2 package of beads → 10 necklaces
3 package of beads → 15 necklaces
4 package of beads → 20 necklaces

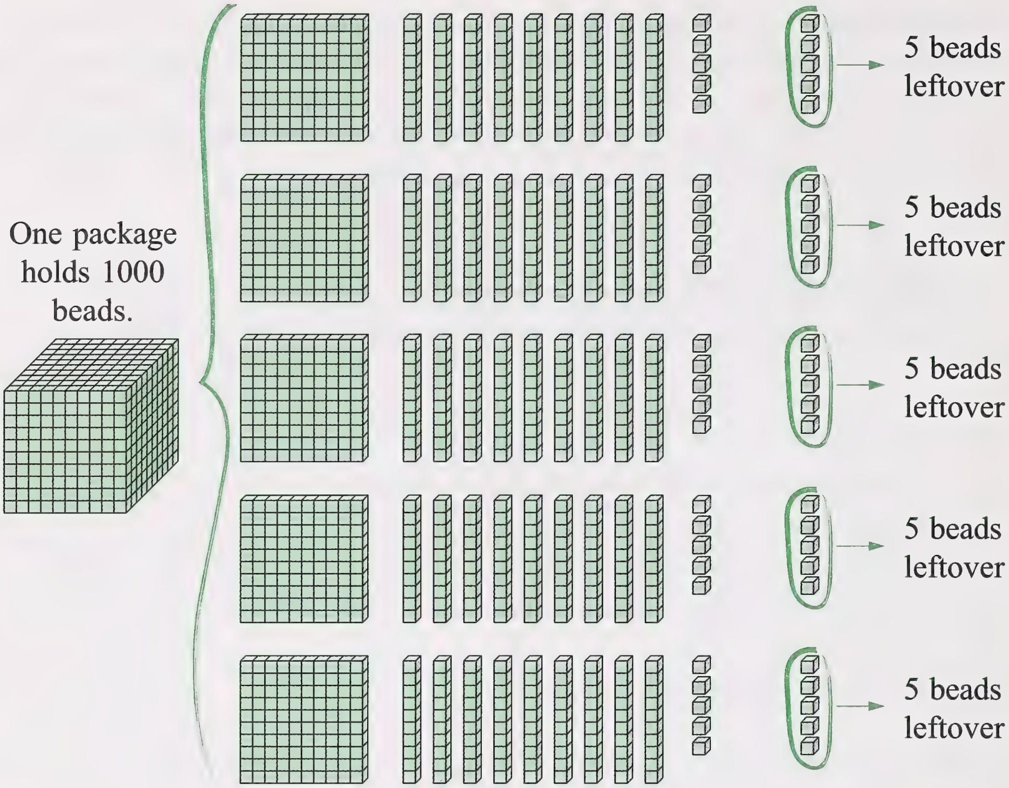
Method 2: Manipulatives

Using base ten blocks, cutouts, or drawings is a good method because you can easily see how many beads are used as each necklace is made.

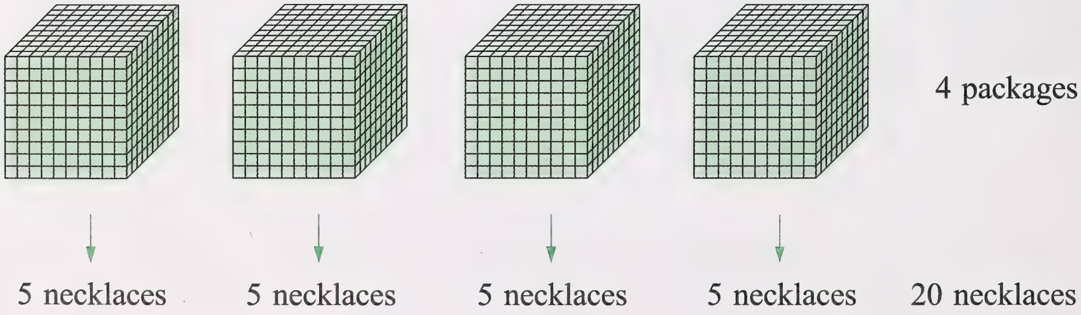
Each necklace uses 195 beads.



One package will make 5 necklaces.


One package holds 1000 beads.
5 beads leftover
5 beads leftover
5 beads leftover
5 beads leftover
5 beads leftover

If you can make 5 necklaces from 1 package of beads, then to make 20 necklaces you will need 4 packages.


4 packages
5 necklaces
5 necklaces
5 necklaces
5 necklaces
20 necklaces

d. Method: Estimation

The best method is estimation since you need only to find an approximate answer, not an exact one. The numbers can be easily rounded and added in your head.

Rounded

$14.99 → $15.00
$24.95 → $25.00
$38.99 → $40.00
$ 9.95 → $10.00

Total: $90.00

5. Addition Number Facts

14	12	14	16	12
13	13	14	18	13
16	15	17	15	13
16	17	13	14	12
14	15	13	11	15

6. Subtraction Number Facts

6	6	8	8	9
8	7	9	4	3
5	7	8	7	8
7	5	7	9	9
9	6	9	6	7

Day 14: Putting It All Together

Complete the Day 14 activities in Assignment Booklet 4B. This work will be marked by your teacher.

Day 15: Assessing What You Know (II)

Complete the Day 15 activities in Assignment Booklet 4B. This work will be marked by your teacher.

Credits

Some clip art drawings are commercially owned.

Introductory Pages

Basic Number Facts: EyeWire, Inc.
Computers: PhotoDisc, Inc. 2000
Journal Writing: PhotoDisc, Inc. 2000

Page

1	PhotoDisc, Inc. 2000
2	Nova Development Corporation
3	PhotoDisc, Inc. 2000
4	Nova Development Corporation
12	Nova Development Corporation
19	Nova Development Corporation
29	Corbis
58	EyeWire, Inc.
62	PhotoDisc, Inc. 2000
78	PhotoDisc, Inc. 2000
84	EyeWire, Inc.
87	EyeWire, Inc.
89	PhotoDisc, Inc. 2000
94	Corel Corporation
103	RubberBall Productions/EyeWire, Inc.
107	Nova Development Corporation
113	Corel Corporation
181	PhotoDisc, Inc. 2000
183	EyeWire, Inc.

Cut-Out Learning Aids

The cut-out learning aids and pull-out pages appear on the following pages.

Day 3: Base Ten Mat #1

Hundreds (100)	Ter

← (Glue or tape second page here) ←

BASE T

Day 3: Base Ten Mat #1 (continued)

ns (10)	Ones (1)

TEN MAT

Day 4: Four In a Row Game Board

FOUR IN A ROW

(The Addition Game)

7	17	12	9	4
19	2	8	6	14
13	15	11	17	8
5	18	16	3	15
20	10	14	9	16

1	2	3	4	5	6	7	8	9	10

Day 8: Sum Fun Game

NUMBER CARDS 0-9
for Sum Fun Game

1 one	3 three	5 five	7 seven	9 nine
0 zero	2 two	4 four	6 six	8 eight

Day 8: Sum Fun Recording Sheet

______ ______ ______ ______

______ ______ ______ ______

______ ______ ______ ______

______ ______ ______ ______

______ ______ ______ ______

______ ______ ______ ______

______ ______ ______ ______

______ ______ ______ ______

Day 8: Sum Fun Recording Sheet

________ ________ ________ ________

________ ________ ________ ________

________ ________ ________ ________

________ ________ ________ ________

________ ________ ________ ________

________ ________ ________ ________

________ ________ ________ ________

________ ________ ________ ________

Day 8: Sum Fun Recording Sheet

____ ____ ____ ____

____ ____ ____ ____

____ ____ ____ ____

____ ____ ____ ____

____ ____ ____ ____

____ ____ ____ ____

____ ____ ____ ____

____ ____ ____ ____

Day 8: Sum Fun Recording Sheet

____ ____ ____ ____

____ ____ ____ ____

____ ____ ____ ____

____ ____ ____ ____

____ ____ ____ ____

____ ____ ____ ____

____ ____ ____ ____

____ ____ ____ ____

Day 8: Quick Addition Game

The Quick Addition Game

Player ____________________

Question	Estimate	Exact Answer	Score
		Total Score:	

The Quick Addition Game

Player ____________________

Question	Estimate	Exact Answer	Score
		Total Score:	

Day 10: Base Ten Mat #2

(Cut off this strip.)

Ones (1)	Tent

(Glue or tape second page here)

BASE TEN D

Day 10: Base Ten Mat #2 (continued)

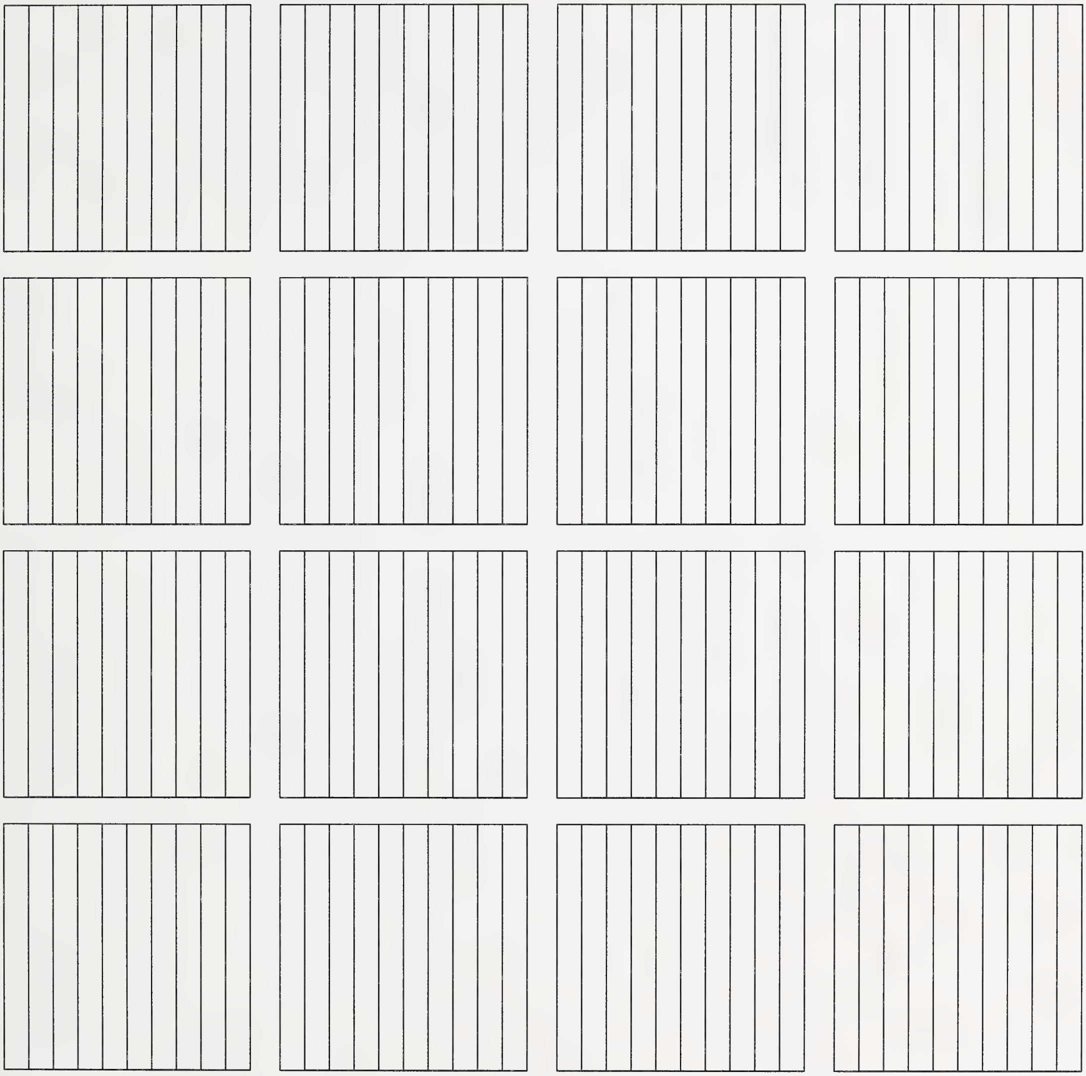
(Cut off this strip.)

hs (0.1)	Hundredths (0.01)

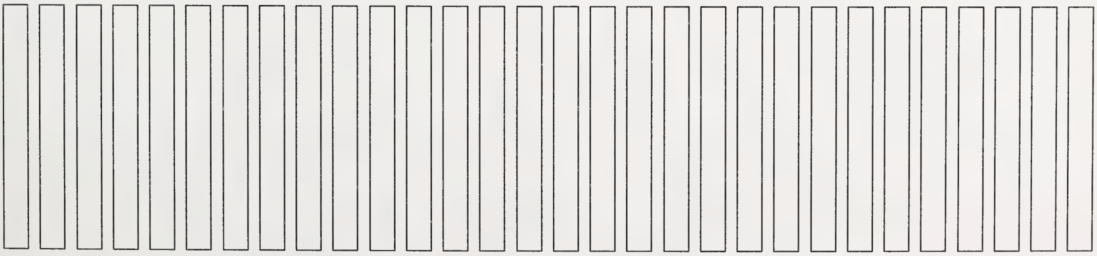
ECIMAL MAT

Day 10: Cutouts

ONES

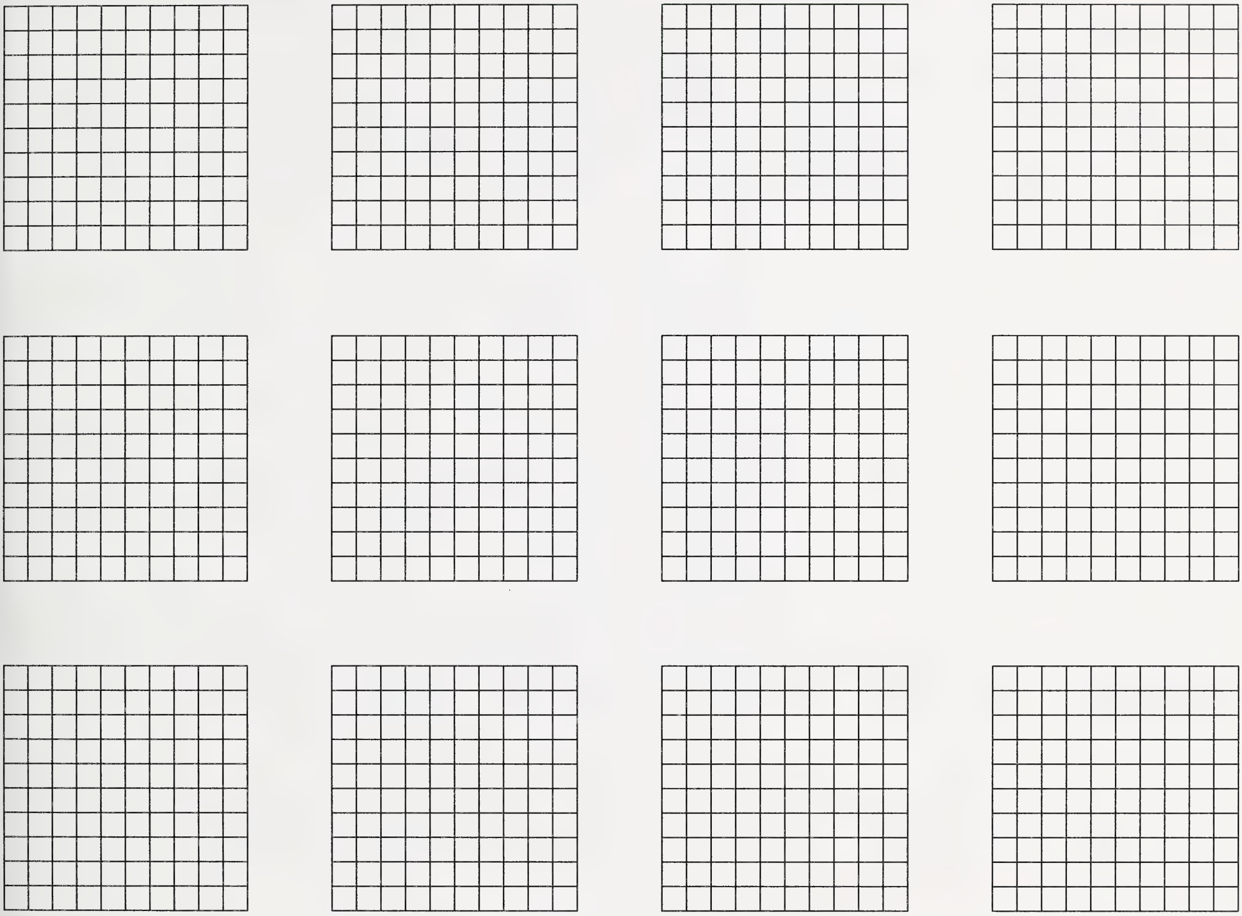


TENTHS

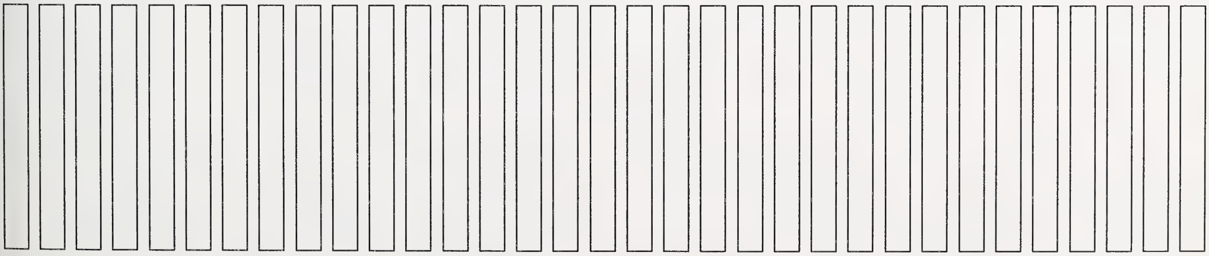


Day 11: Cutouts

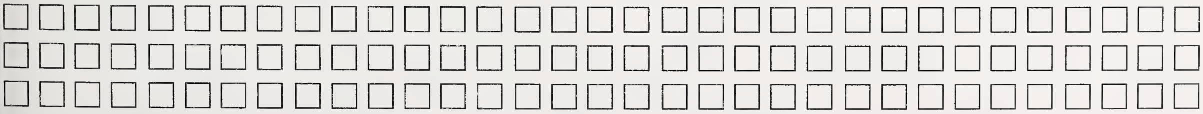
ONES



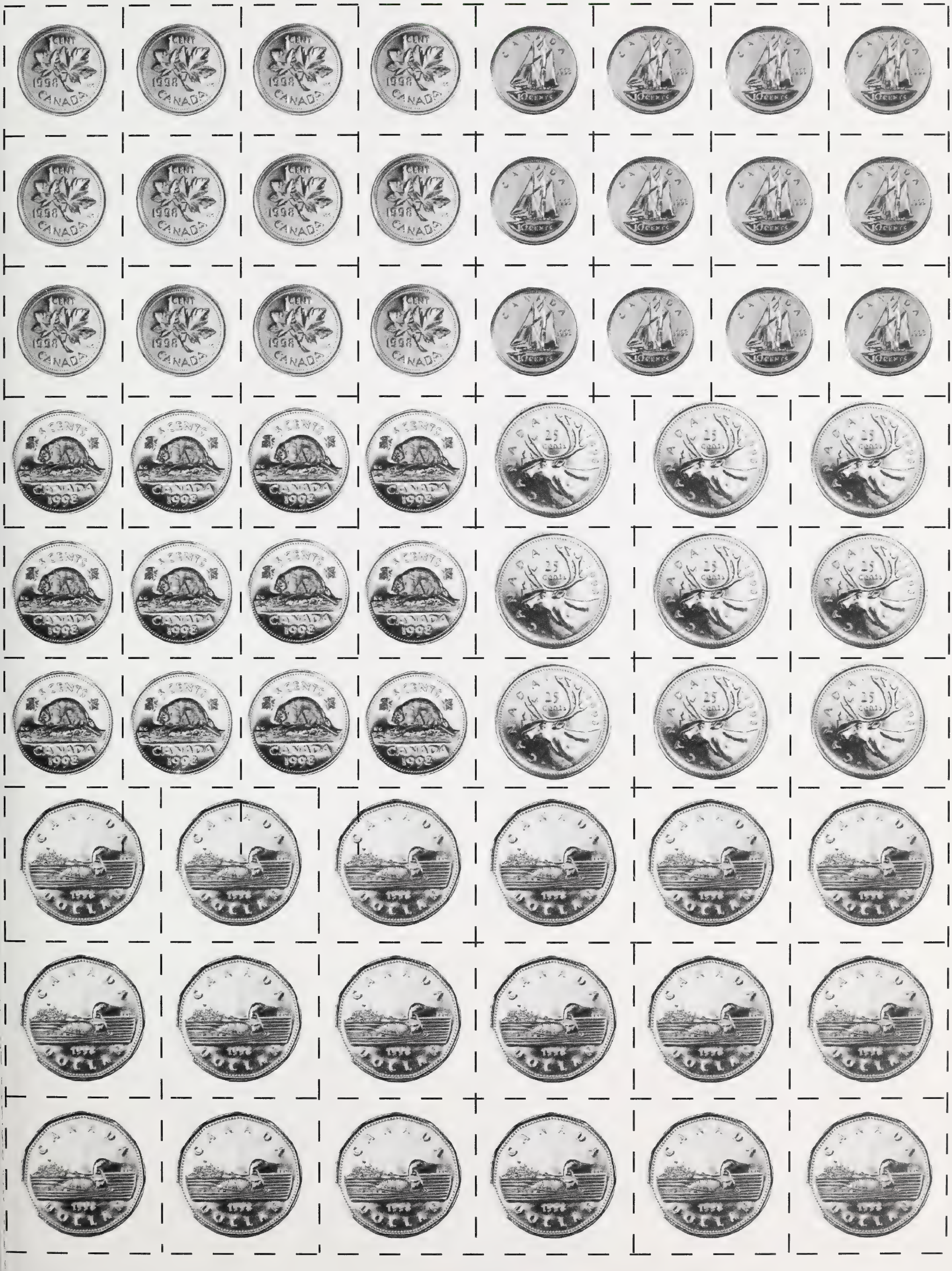
TENTHS



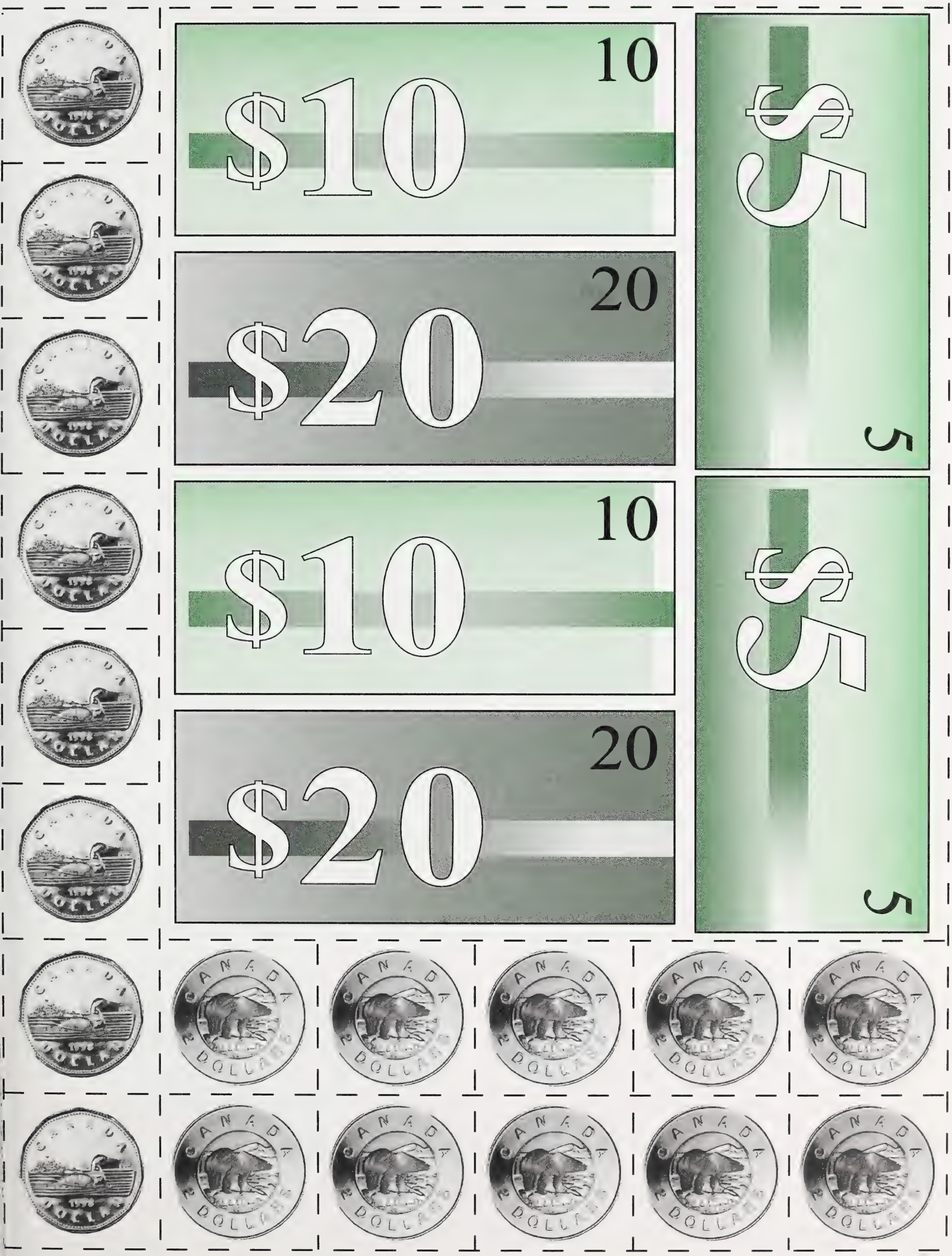
HUNDREDTHS



Day 12: Money

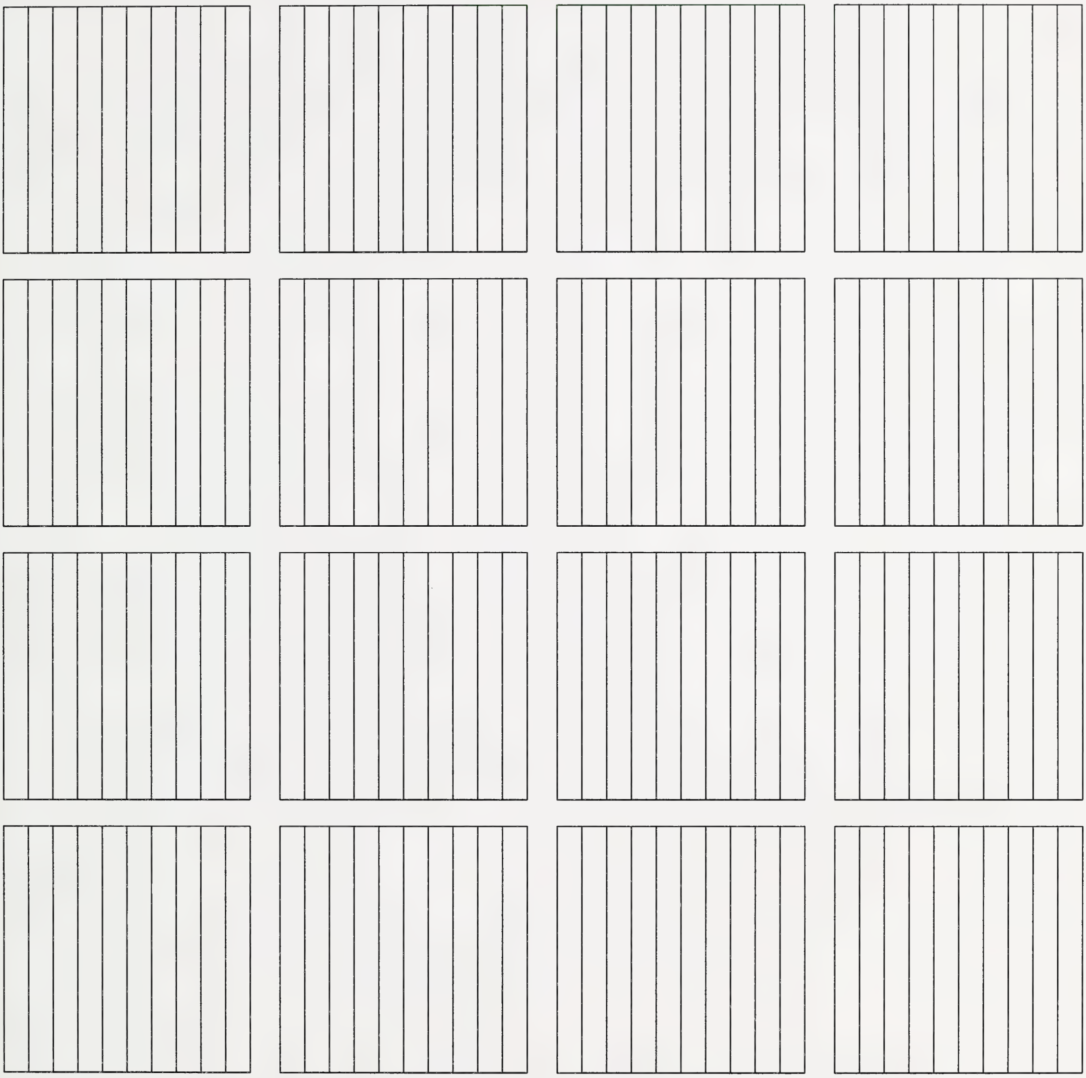


Day 12: Money

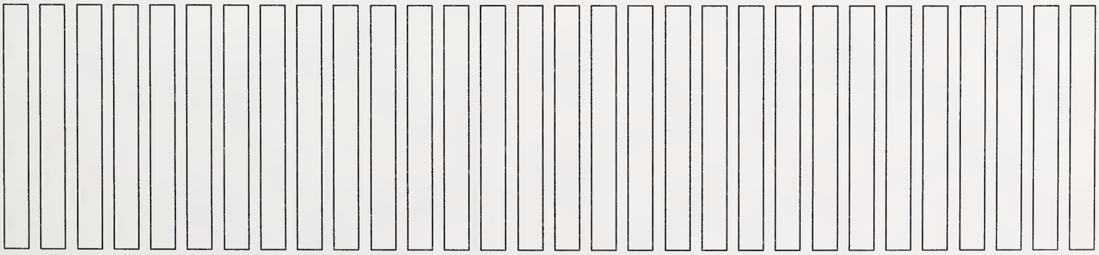

10
$10
$5
20
$20
5
10
$10
$5
20
$20
5
CANADA
DOLLAR
CANADA
2 DOLLARS

Day 15: Cutouts

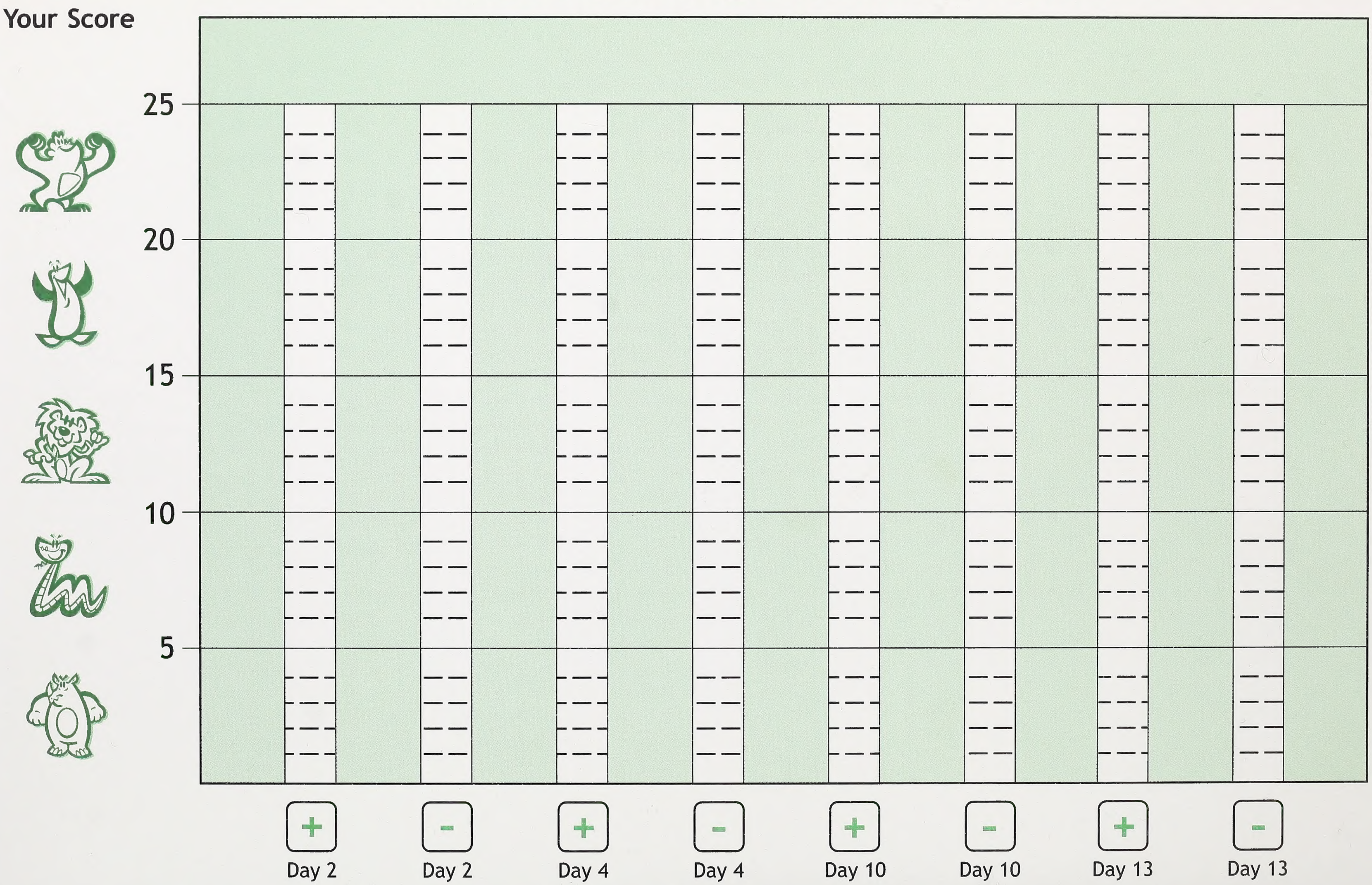
ONES



TENTHS



Number Facts Progress Chart for Module 4



Mathematics 4
Student Module Booklet
Module 4

LRDC

2000